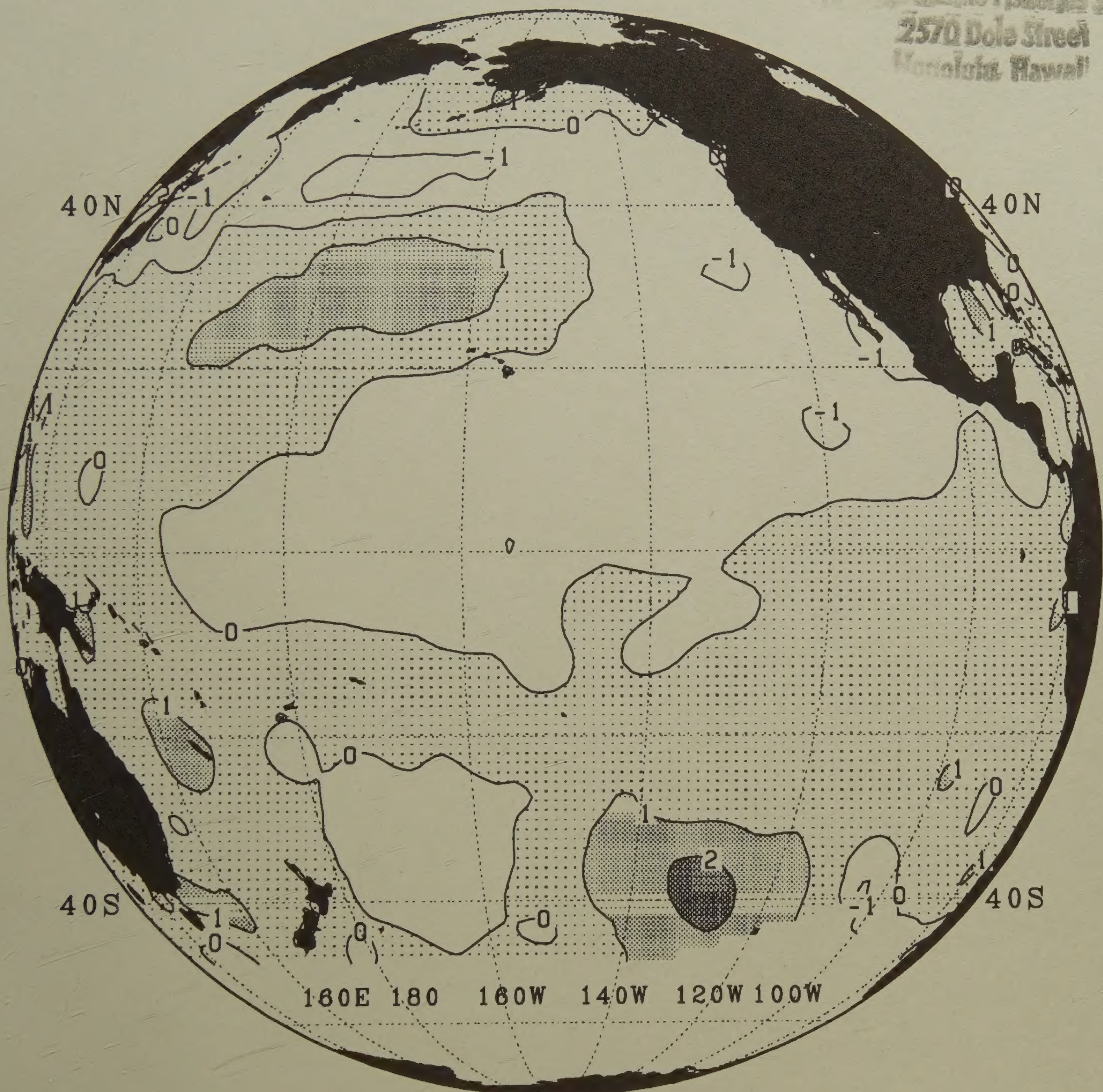
気象庁海洋月報

Monthly Ocean Report
March 2001 (No. 99)



Climate and Marine Department
Japan Meteorological Agency

気象庁 気候・海洋気象部

平成13年3月

気象庁海洋月報は、気象庁 気候・海洋気象部 海洋気象情報室で作成しています。
本月報に関する問い合わせは、

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Monthly Ocean Report is prepared by the Office of Marine Prediction, Climate and Marine Department, Japan Meteorological Agency.

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表紙は、2001年3月の太平洋の月平均海面水温偏差図です。
陰影部は、平年より高温の海域を示しています。

The figure on the front cover shows the monthly mean SST anomalies for March 2001 in the Pacific Ocean.
Areas of positive anomalies are shaded.

目　次

Table of Contents

海況の特徴（２００１年３月）

日本近海の海況

海面水温は、40°N 以北で平年より 1℃以上低く、日本海北部と北海道の太平洋岸、及び千島列島の南東沖には-2℃を超える負偏差が見られた（第４図）。

黒潮は、東海沖で離岸し、上旬は 32°N、137°E 付近まで南下して東に流れた後、140.5°E 付近で北上し三宅島付近を通っていた。中・下旬は 32°N、139°E 付近まで南下した後、140°E 付近を北上して、房総半島沿いを北東に流れていた（第９図）。

太平洋の海況

太平洋赤道域の海面水温は、170°E から 150°W にかけて平年より 0.5℃以上低かった。一方、130°E から 150°E にかけてと 110°W から 85°W にかけては平年より 0.5℃以上高かった。

北太平洋の海面水温は、25°N から 35°N の 160°E から 155°W にかけて平年より 1℃以上高かった。一方、25°N から 45°N の北米大陸沖と 40°N から 50°N の 155°W 以西では平年より 0.5℃以上低く、170°E から 160°W にかけてと 160°E 以西には-1℃を超える負偏差が見られた（第１７図）。

Highlights March 2001

Seas adjacent to Japan

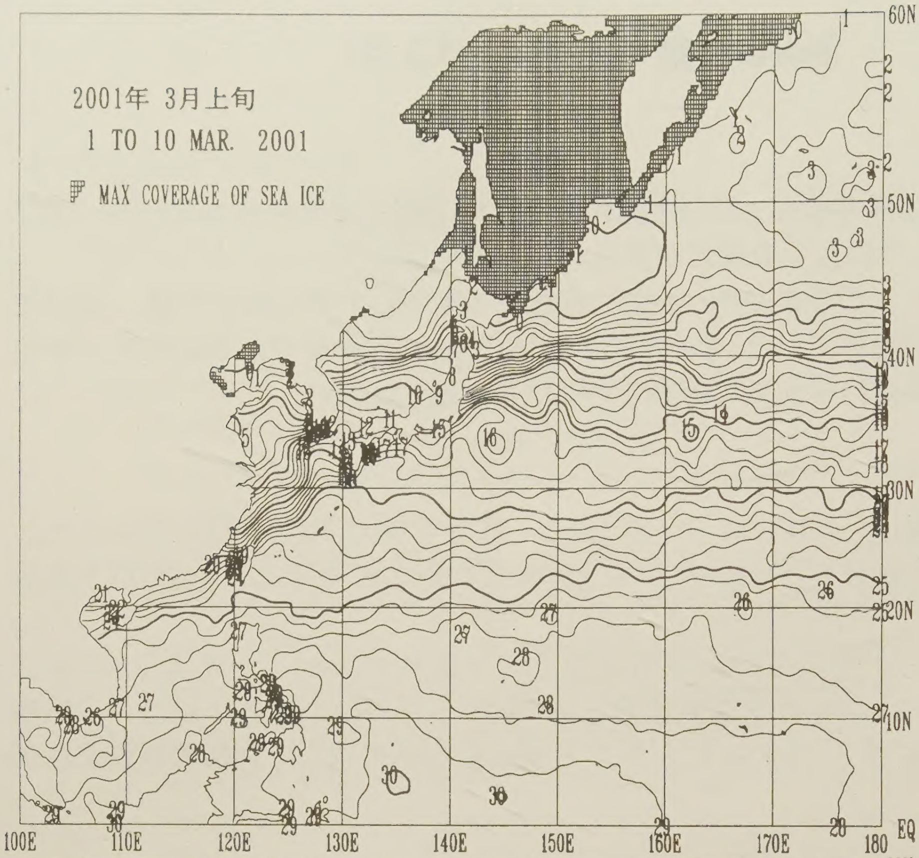
SSTs were more than 1℃ below normal north of 40°N. Negative SST anomalies exceeding –2℃ were found in the northern part of the Japan Sea, south of Hokkaido and southeast of the Kuril Islands (Fig. 4).

The Kuroshio flowed SE-ward off Tokai through the month. In the first 10-day of the month, it flowed eastward near 32°N, 137°E and turned northward along 140.5°E, and passed near Miyake Island. In the rest of the month, it flowed near 32°N, 139°E then turned northward along 140°E. The Kuroshio flowed NE-ward off the Boso Peninsula through the month (Fig. 9).

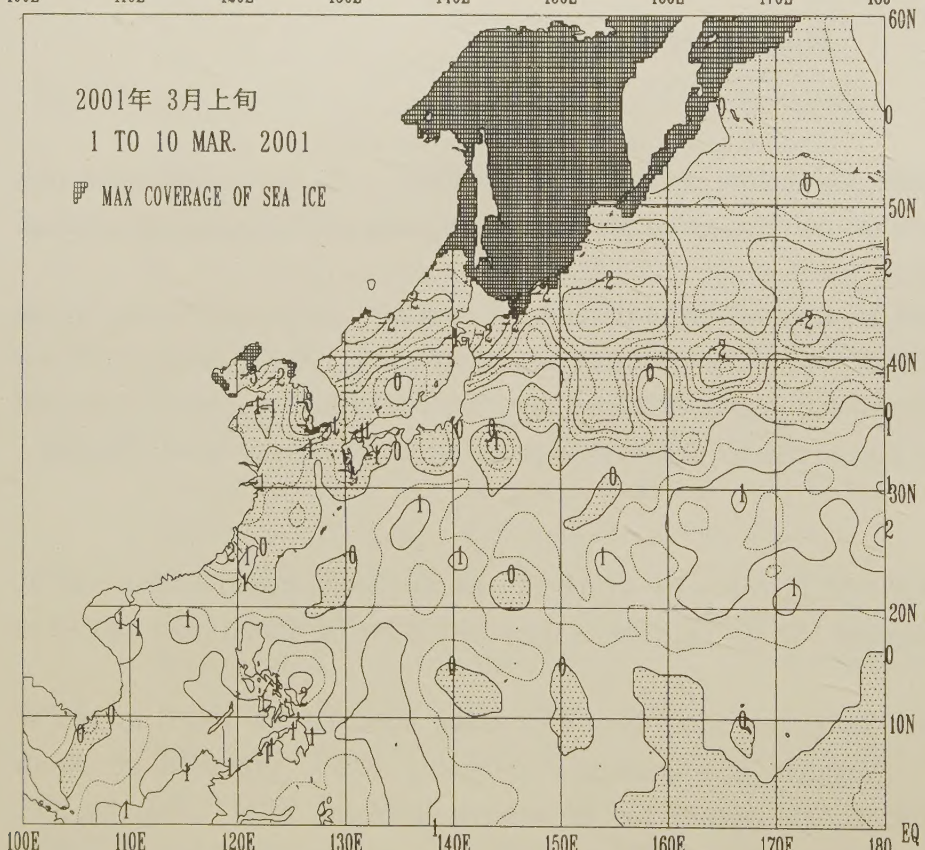
Pacific Ocean

In the equatorial Pacific, SSTs were more than 0.5℃ below normal from 170°E to 150°W. Positive SST anomalies exceeding +0.5℃ were found from 130°E to 150°E and from 110°W to 85°W.

In the North Pacific, SSTs were more than 1℃ above normal from 160°E to 155°W between 25°N and 35°N. Negative SST anomalies exceeding –0.5℃ prevailed off North America between 25°N and 45°N, and west of 155°W between 40°N and 50°N. Negative SST anomalies exceeding –1℃ were found from 170°E to 160°W and west of 160°E between 40°N and 50°N (Fig. 17).

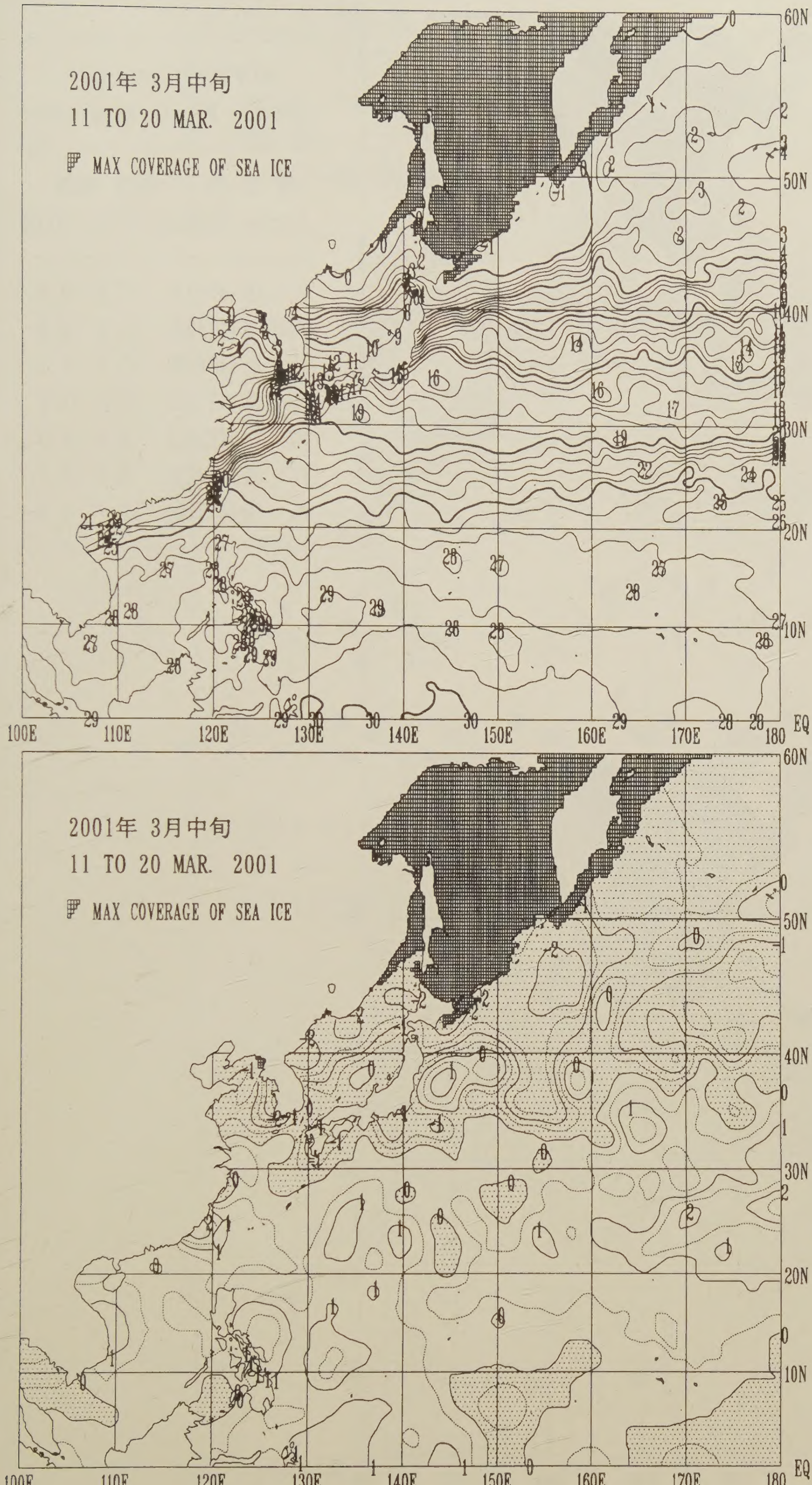


旬平均沿岸水温(℃) Coastal Water Temperature		
地点名 (Index Number)	水温 Temp.	偏差 Anom.
石垣(47918)	21.8	0.1
御前崎(47655)	11.7	0.3
八丈島(47678)	16.7	-0.2
小名浜(47598)	7.5	-1.5
宮古(47585)	4.9	-1.5
江差(47428)	5.1	-0.7
浜田(47755)	11.5	-0.3



第1図 北西太平洋旬平均海面水温図(上)及び偏差図(下) (2001年 3月上旬)

Fig.1 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 1st ten-day period in MAR 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



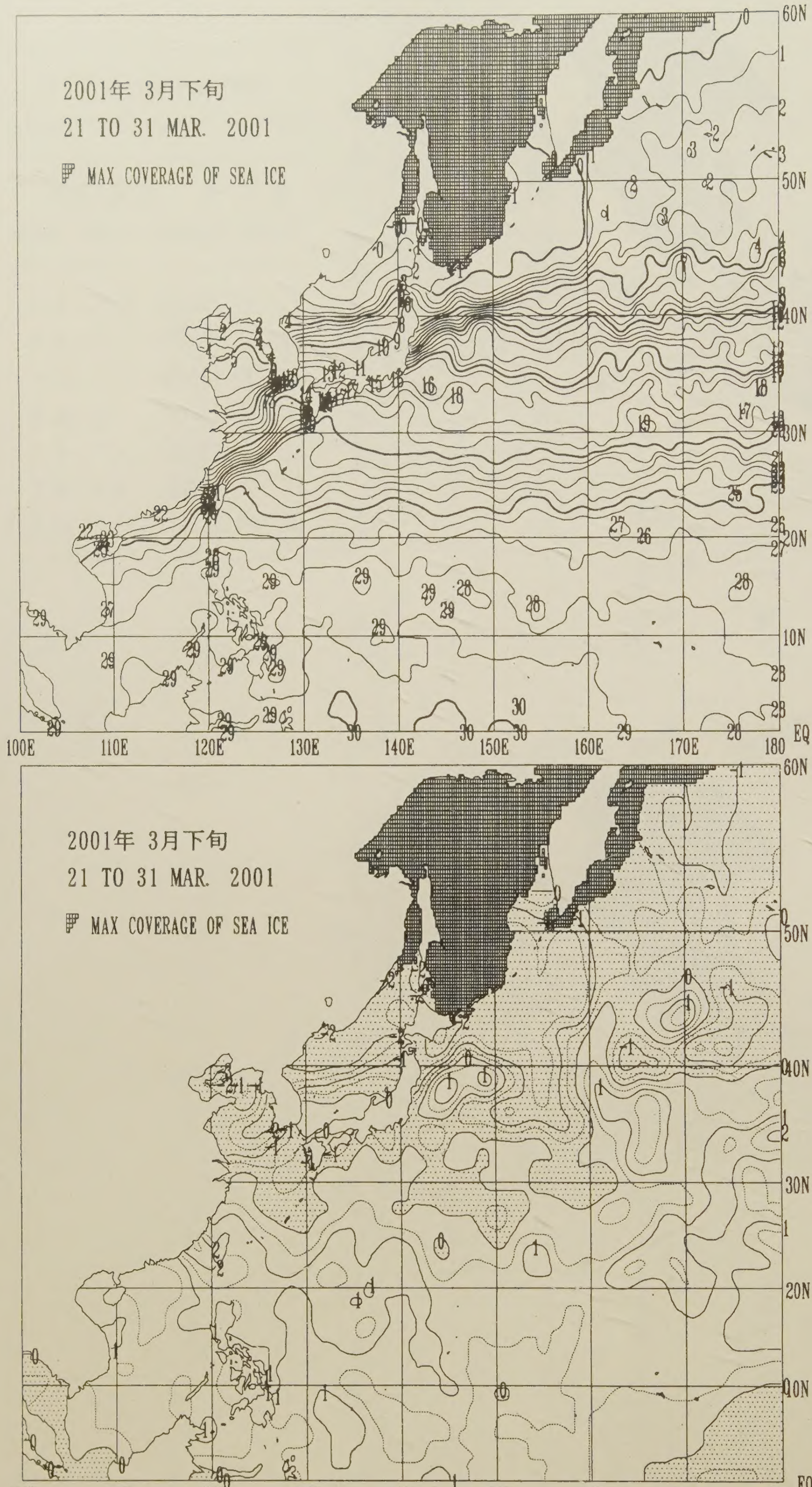
旬平均沿岸水温(℃)
Coastal Water Temperature

地点名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣(47918)	22.5	0.1
御前崎(47655)	11.6	-0.6
八丈島(47678)	16.2	-1.2
小名浜(47598)	7.2	-1.8
宮　古(47585)	4.5	-1.7
江　差(47428)	6.8	0.7
浜　田(47755)	11.7	-0.7

第2図 北西太平洋旬平均海面水温図(上)及び偏差図(下) (2001年 3月中旬)

Fig. 2 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 2nd ten-day period in MAR 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.

Ten-day mean SST & Anomalies

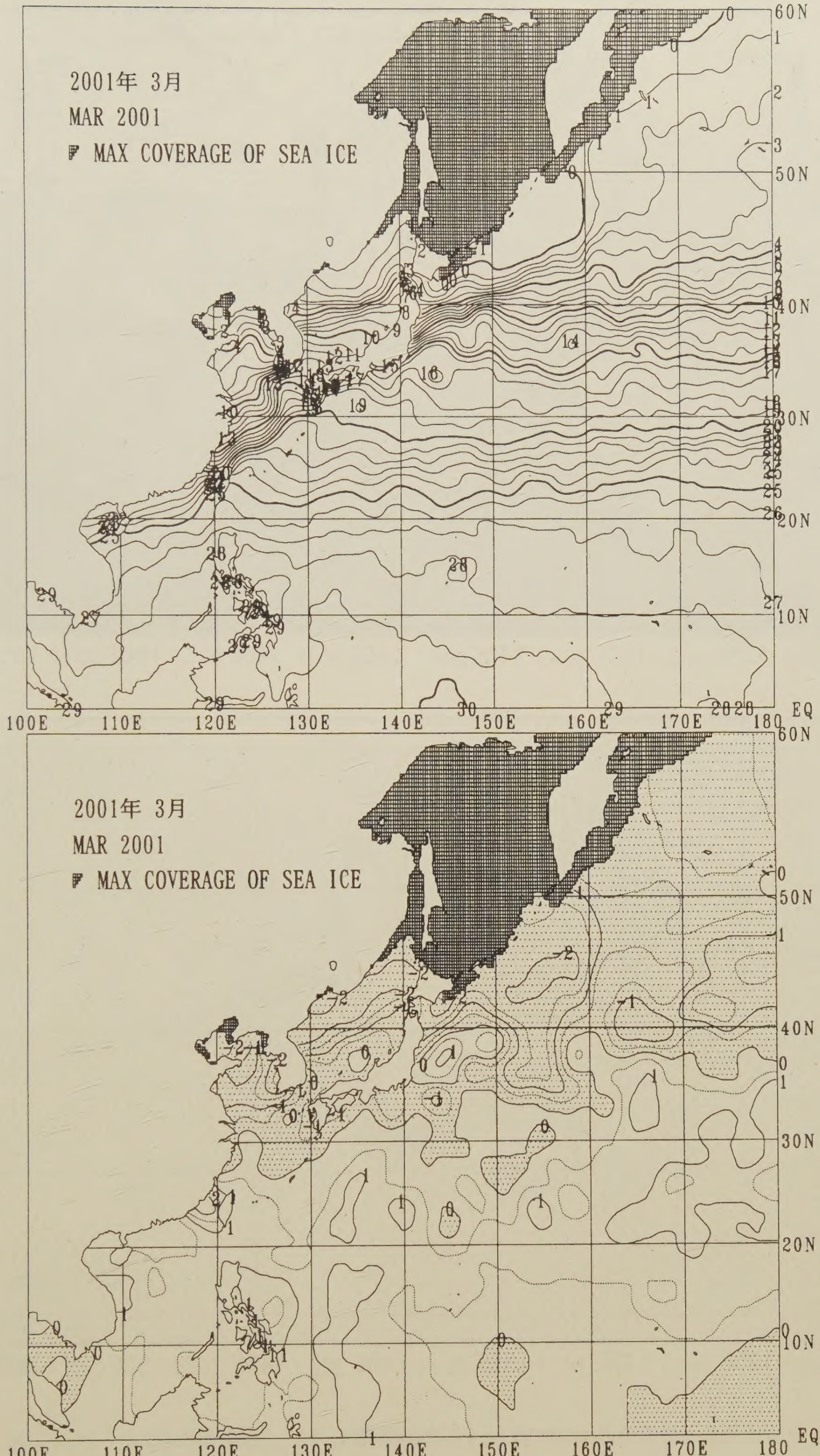


旬平均沿岸水温(℃)
Coastal Water Temperature

地点名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣(47918)	23.3	0.4
御前崎(47655)	13.6	0.6
八丈島(47678)	17.5	-0.1
小名浜(47598)	7.8	-1.3
宮　古(47585)	5.9	-0.3
江　差(47428)	6.8	0.1
浜　田(47755)	13.7	0.8

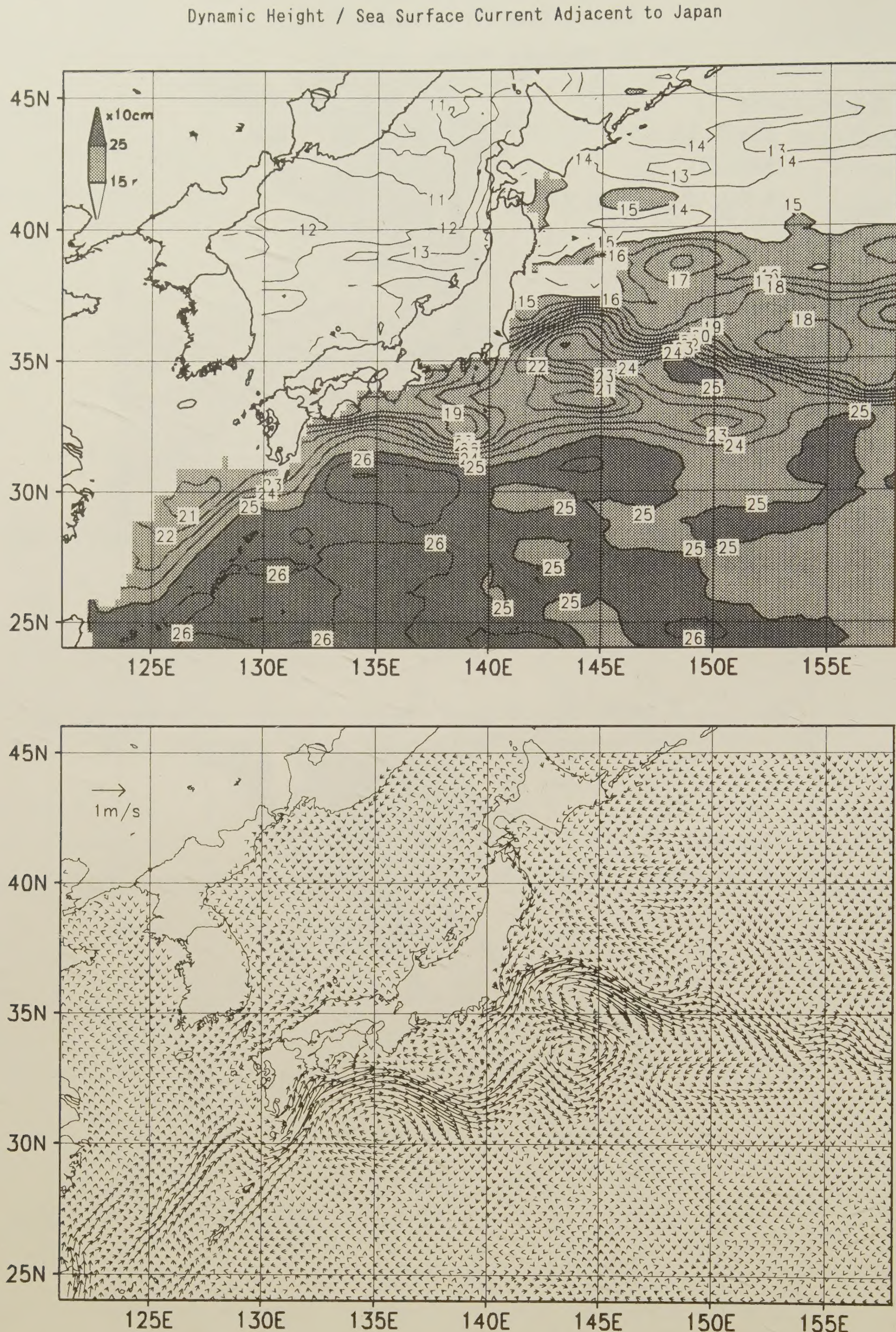
第3図 北西太平洋旬平均海面水温図(上)及び偏差図(下) (2001年 3月下旬)

Fig. 3 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 3rd ten-day period in MAR 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



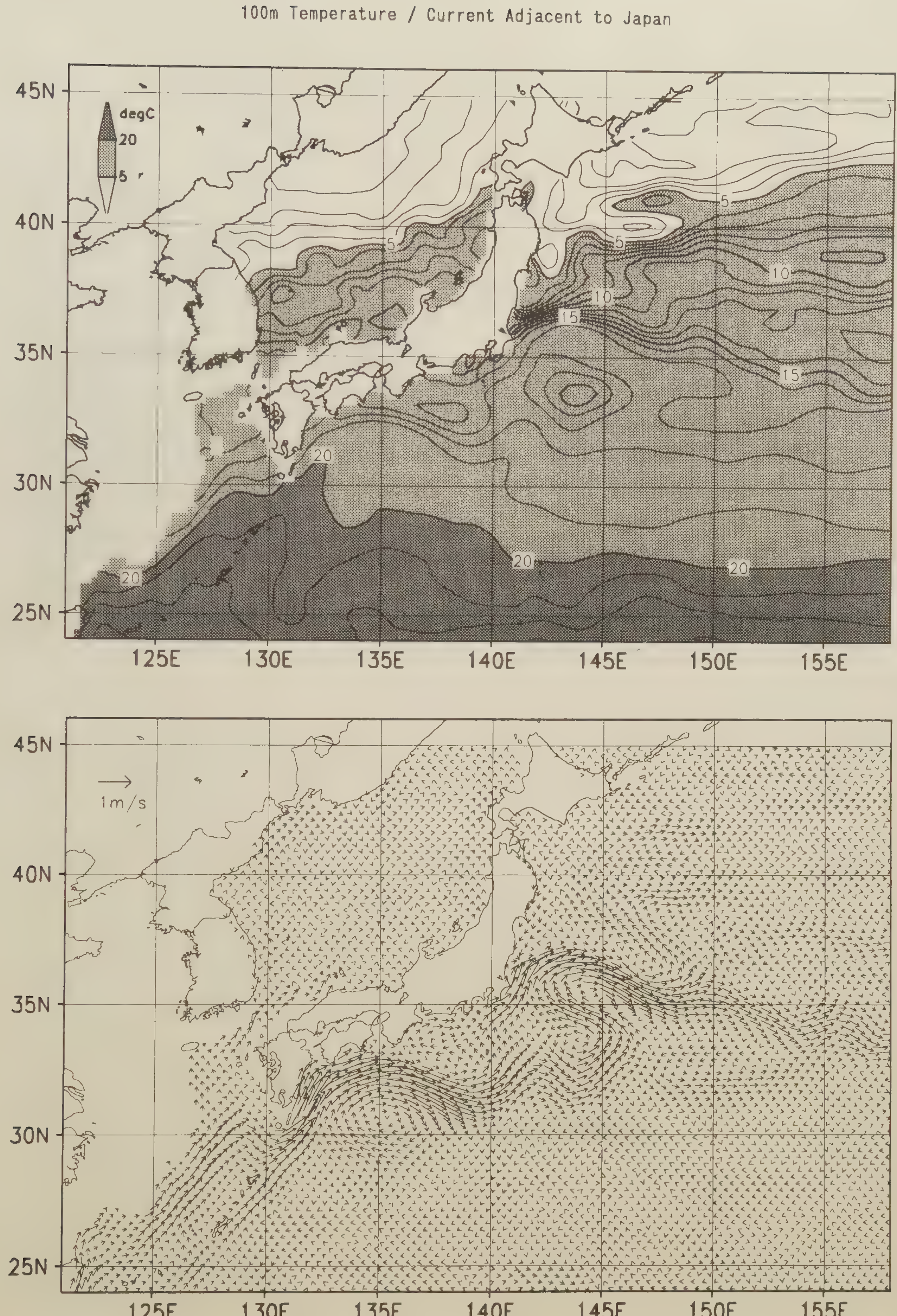
第4図 北西太平洋月平均海面水温図(上)及び偏差図(下) (2001年 3月)

Fig. 4 Monthly mean SST (top) and anomalies (bottom) in the western North Pacific for MAR 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



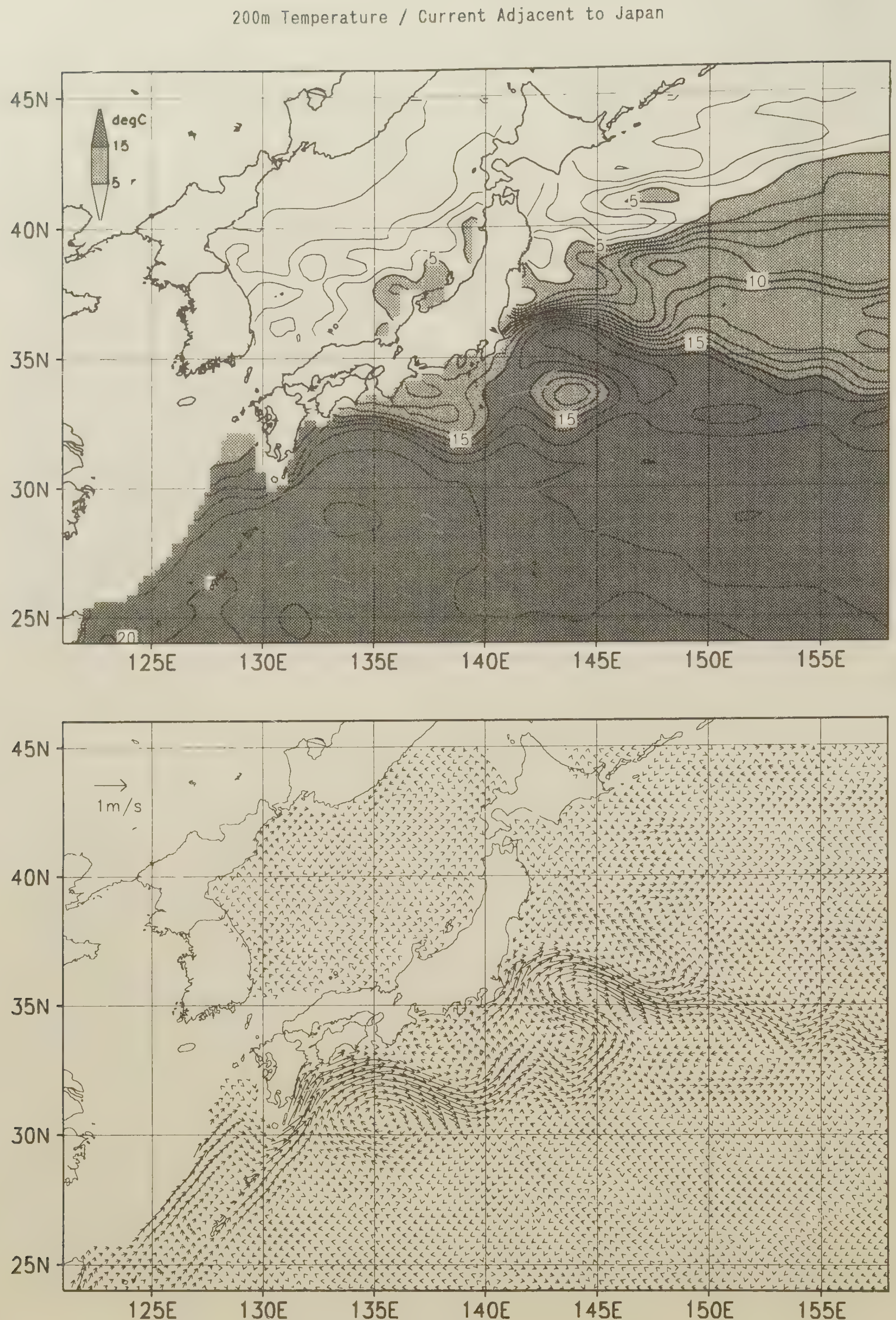
第 5 図　日本近海月平均海面高度分布図 (上) と海面海流図 (下)　(2001 年 3 月)
(海洋総合解析システムによる)

Fig. 5　Monthly mean sea surface height (top) and current (bottom) in seas adjacent to Japan for March 2001. Contour interval is 10cm (top). (calculated by the Ocean Comprehensive Analysis System)



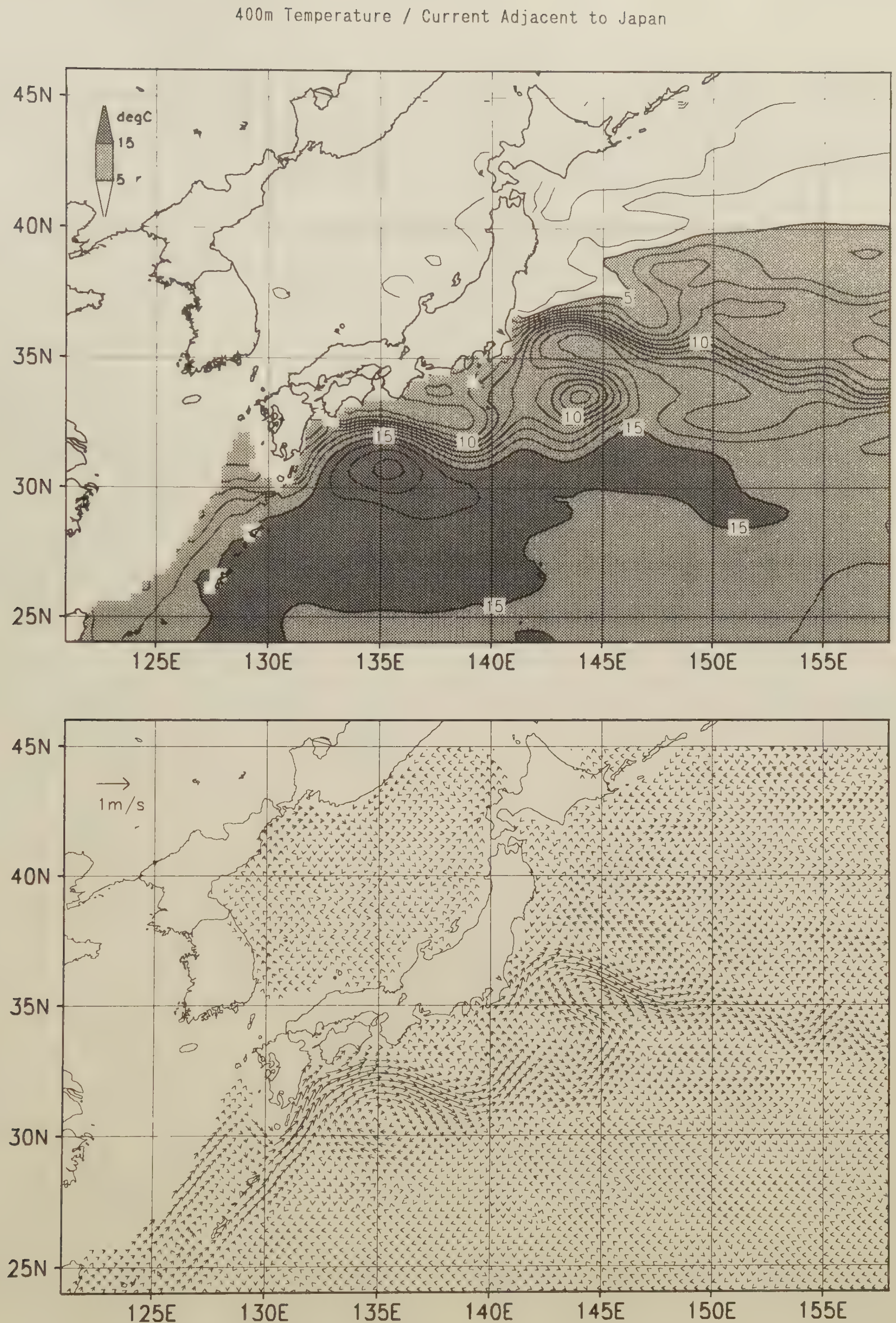
第 6 図　日本近海月平均表層水温図（上）と表層海流図（下）（深さ 100 m）（2001 年 3 月）
（海洋総合解析システムによる）

Fig. 6　Monthly mean subsurface (100 m) temperature (top) and current (bottom) in seas adjacent to Japan for March 2001. Contour interval is 1 ℃ (top). (calculated by the Ocean Comprehensive Analysis System)



第７図　日本近海月平均表層水温図（上）と表層海流図（下）（深さ 200 m）（2001 年 3 月）
（海洋総合解析システムによる）

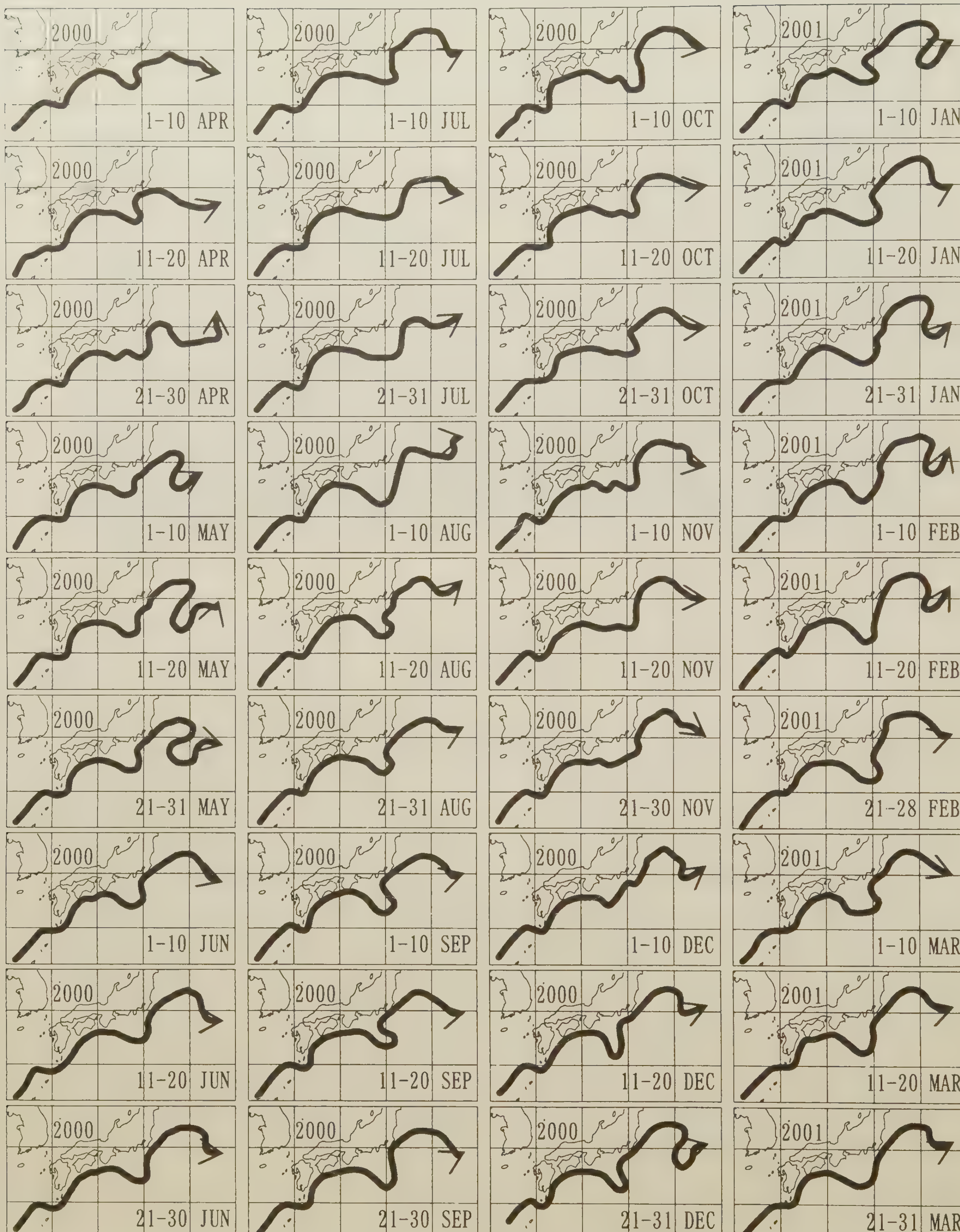
Fig. 7　Monthly mean subsurface (200 m) temperature (top) and current (bottom) in seas adjacent to Japan for March 2001. Contour interval is 1 ℃ (top). (calculated by the Ocean Comprehensive Analysis System)



第 8 図　日本近海月平均表層水温図（上）と表層海流図（下）　（深さ 400 m）（2001 年 3 月）
（海洋総合解析システムによる）

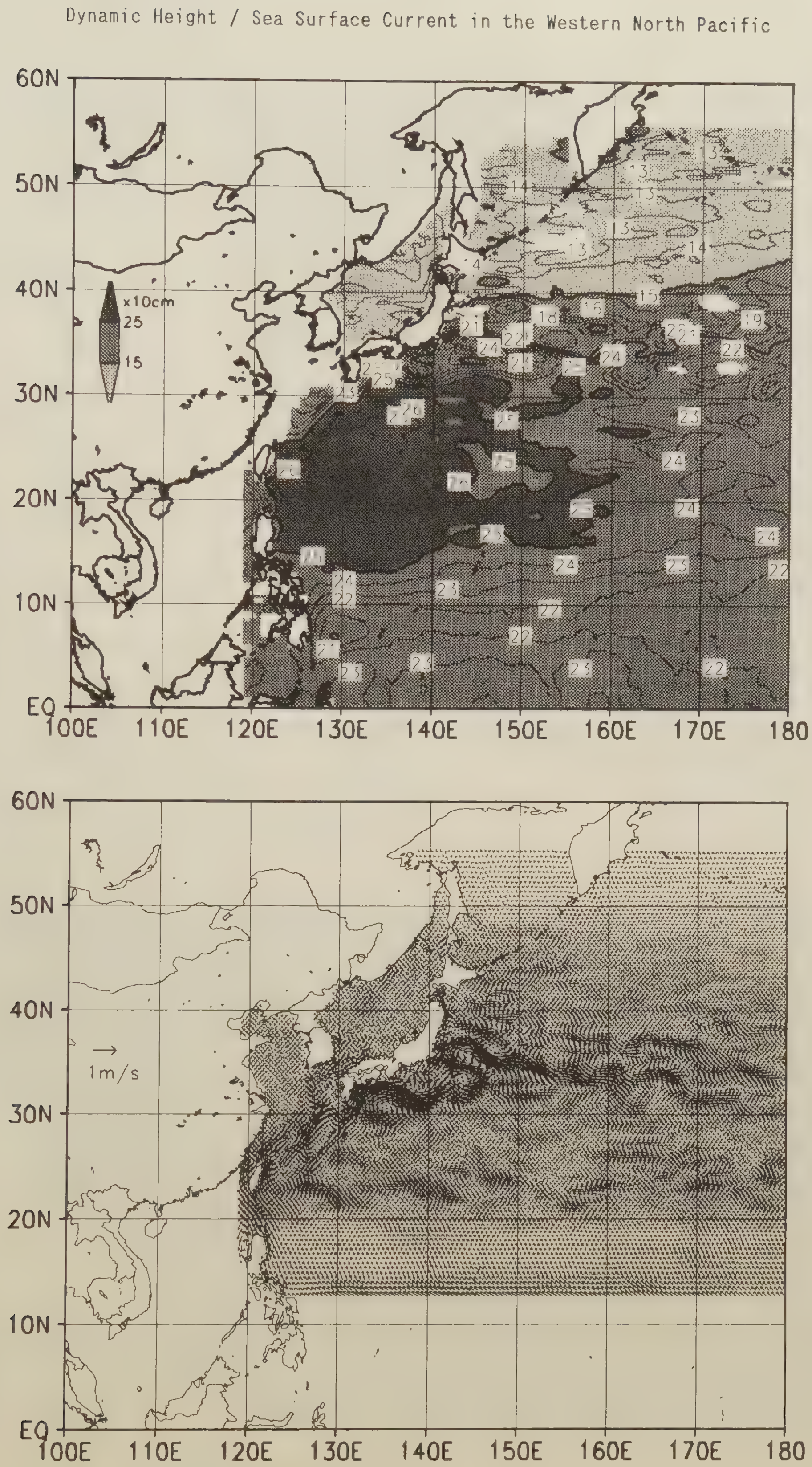
Fig. 8　Monthly mean subsurface (400 m) temperature (top) and current (bottom) in seas adjacent to Japan for March 2001. Contour interval is 1 ℃ (top). (calculated by the Ocean Comprehensive Analysis System)

Location of the Kuroshio axis



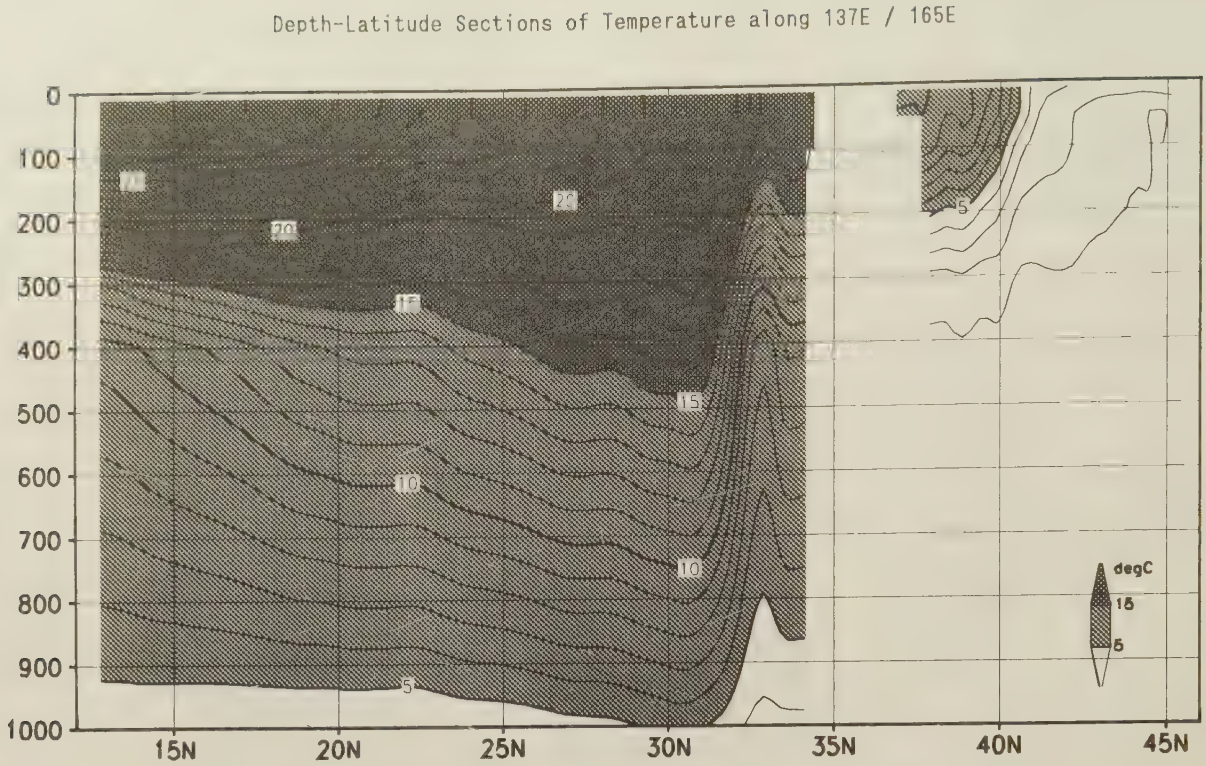
第9図　旬別黒潮流軸図

Fig. 9 Location of the Kuroshio axis



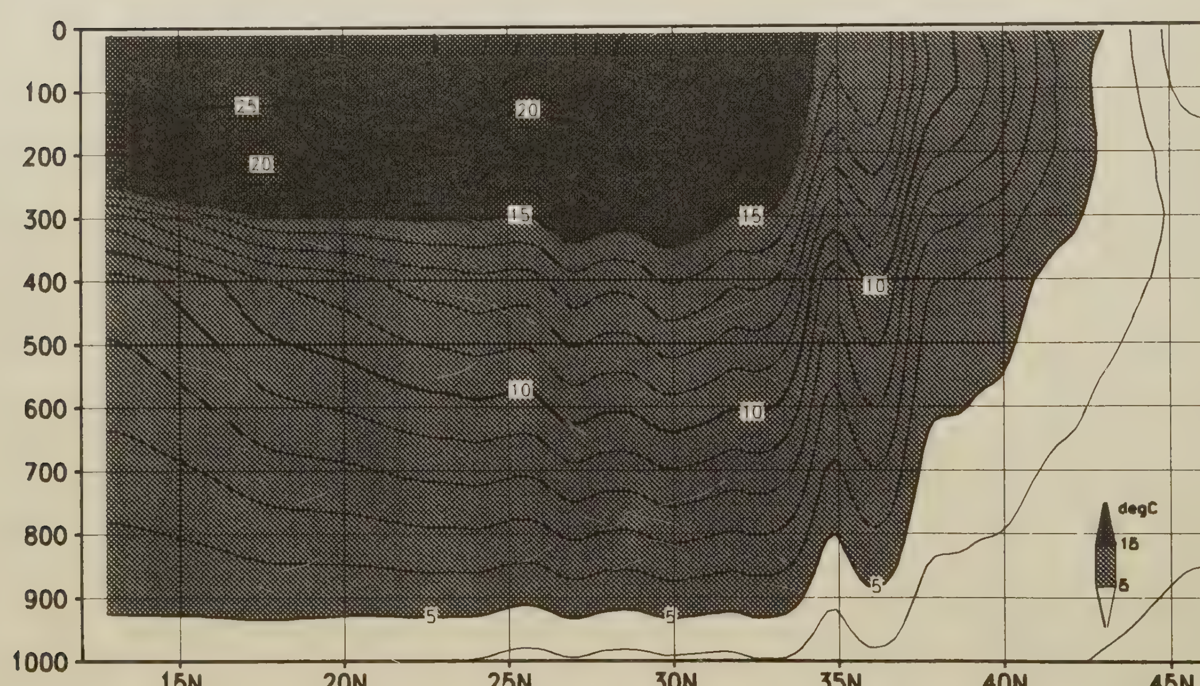
第 10 図　北西太平洋月平均海面高度分布図 (上) と海面海流図 (下) (2001 年 3 月)
(海洋総合解析システムによる)

Fig. 10　Monthly mean sea surface height (top) and current (bottom) in the western North Pacific for March 2001. Contour interval is 10cm (top). (calculated by the Ocean Comprehensive Analysis System)



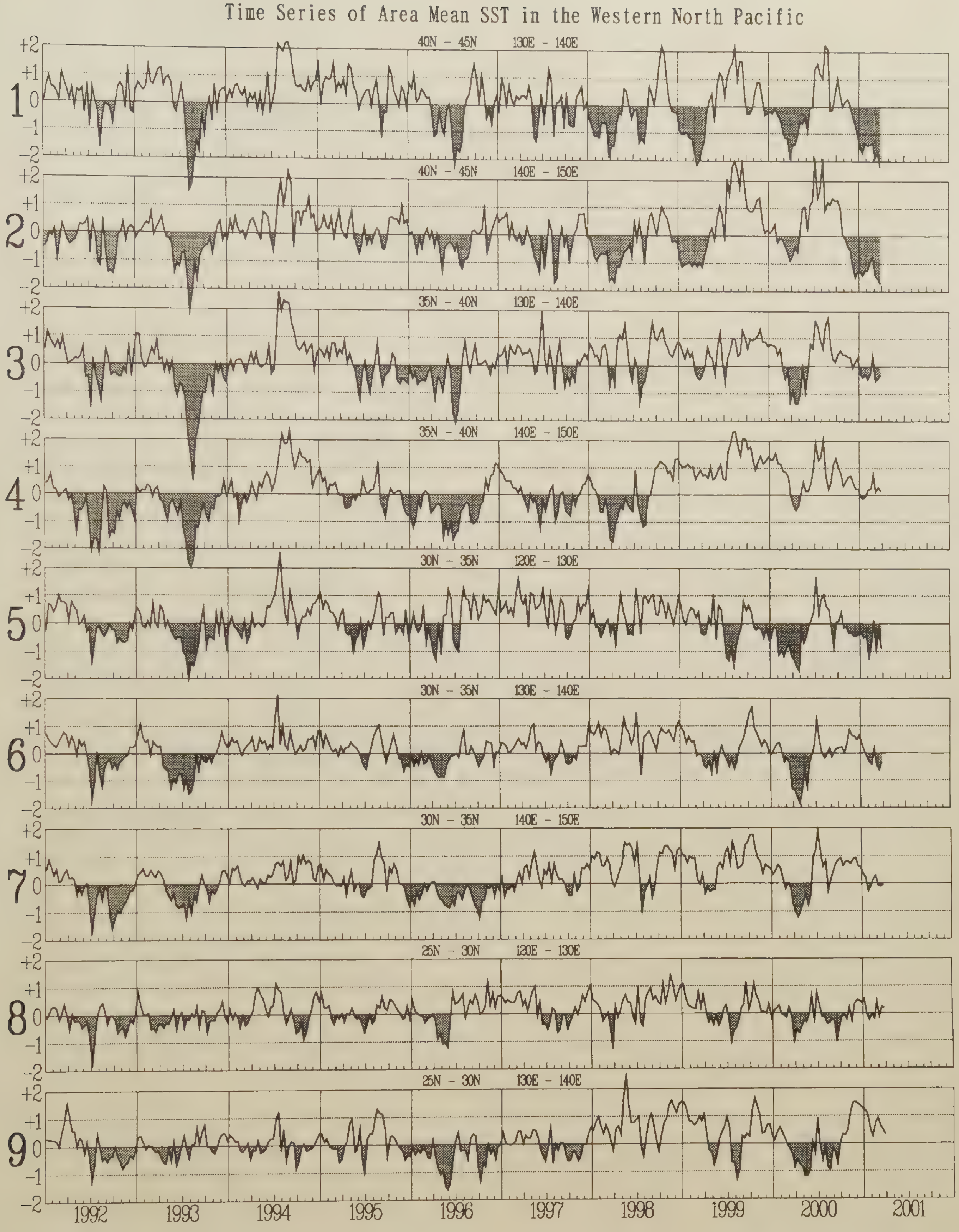
第 11 図　東経 137° 線に沿う月平均表層水温の鉛直断面図 （2001 年 3 月）
（海洋総合解析システムによる）

Fig. 11　Vertical cross section of monthly mean temperature along 137 °E for March 2001. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



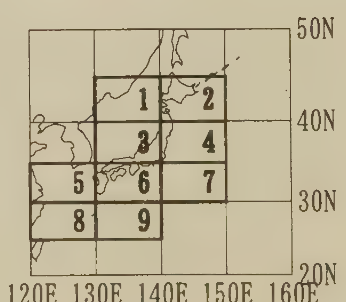
第 12 図　東経 165° 線に沿う月平均表層水温の鉛直断面図 （2001 年 3 月）
（海洋総合解析システムによる）

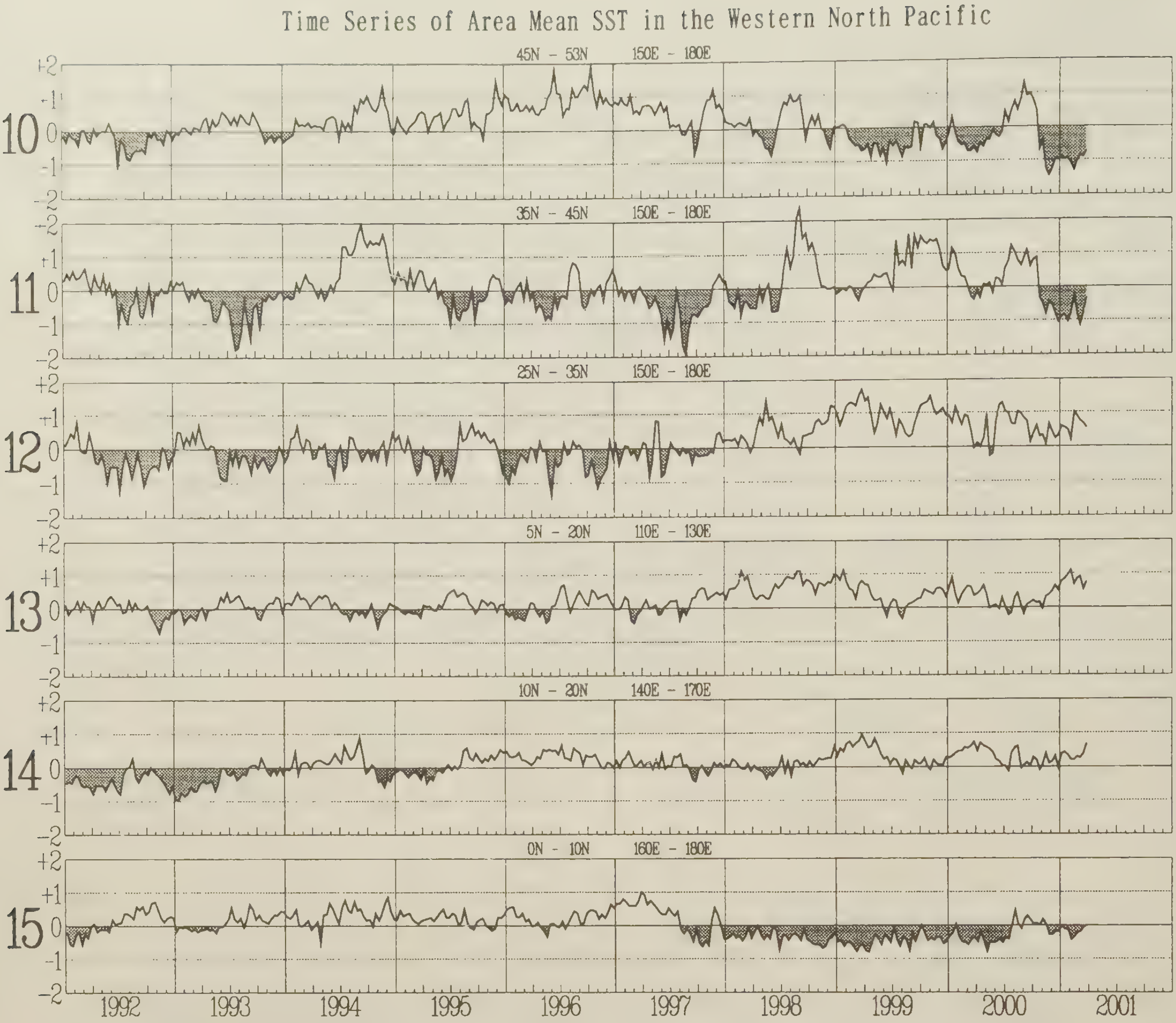
Fig. 12　Vertical cross section of monthly mean temperature along 165 °E for March 2001. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



第13図　海域別旬平均海面水温平年偏差時系列図

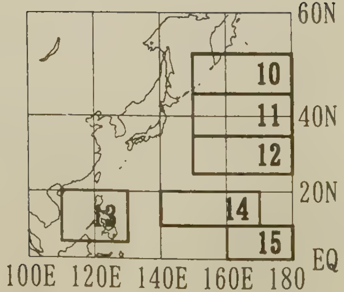
Fig. 13 Time series of the ten-day mean SST anomalies (°C) in the western North Pacific for the areas shown in the right panel. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1971-2000).

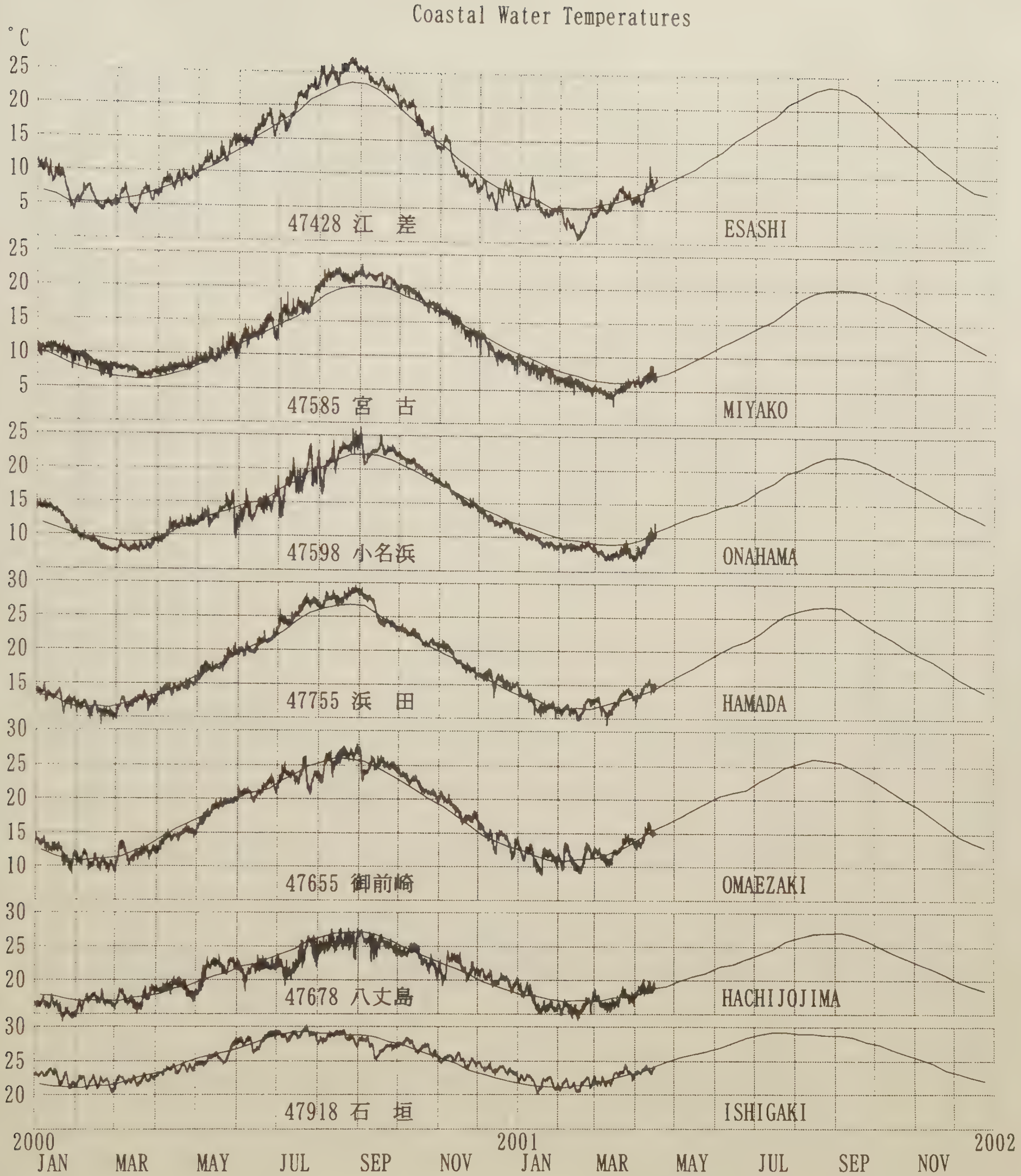




第13図　海域別旬平均海面水温平年偏差時系列図（つづき）

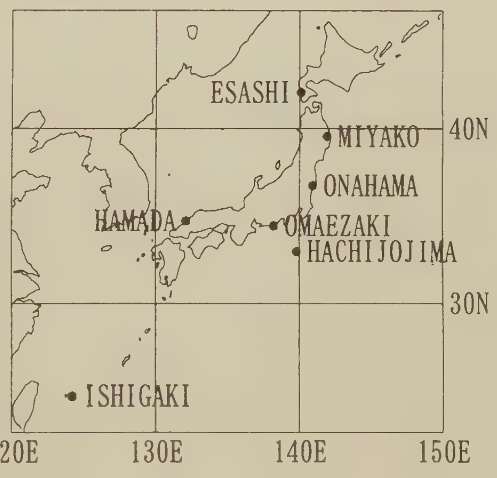
Fig. 13 (continue) Time series of the ten-day mean SST anomalies (°C) in the western North Pacific for the areas shown in the right panel. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1971-2000).

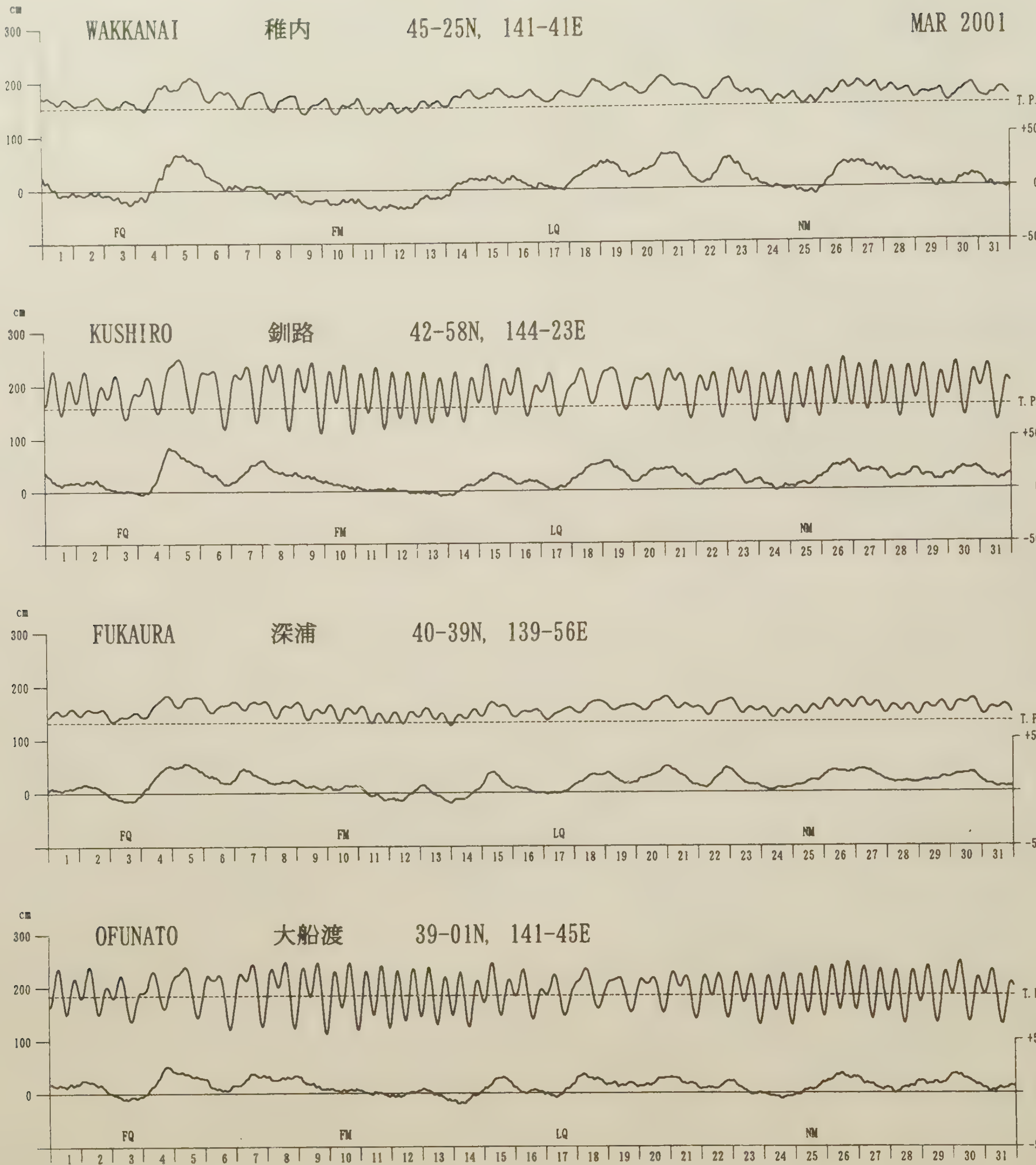




第14図 沿岸水温時系列図

Fig. 14 Time series of hourly coastal water temperatures (°C) measured at 7 coastal stations of the JMA shown in the right panel.
Thin lines show ten-day mean climatology.

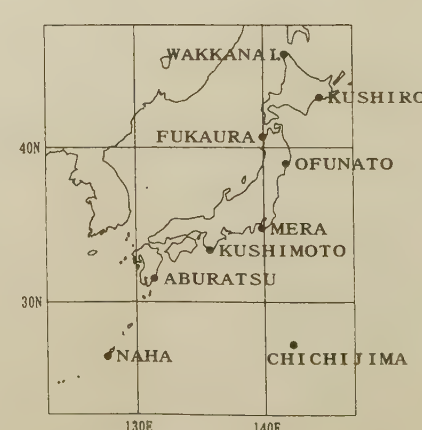


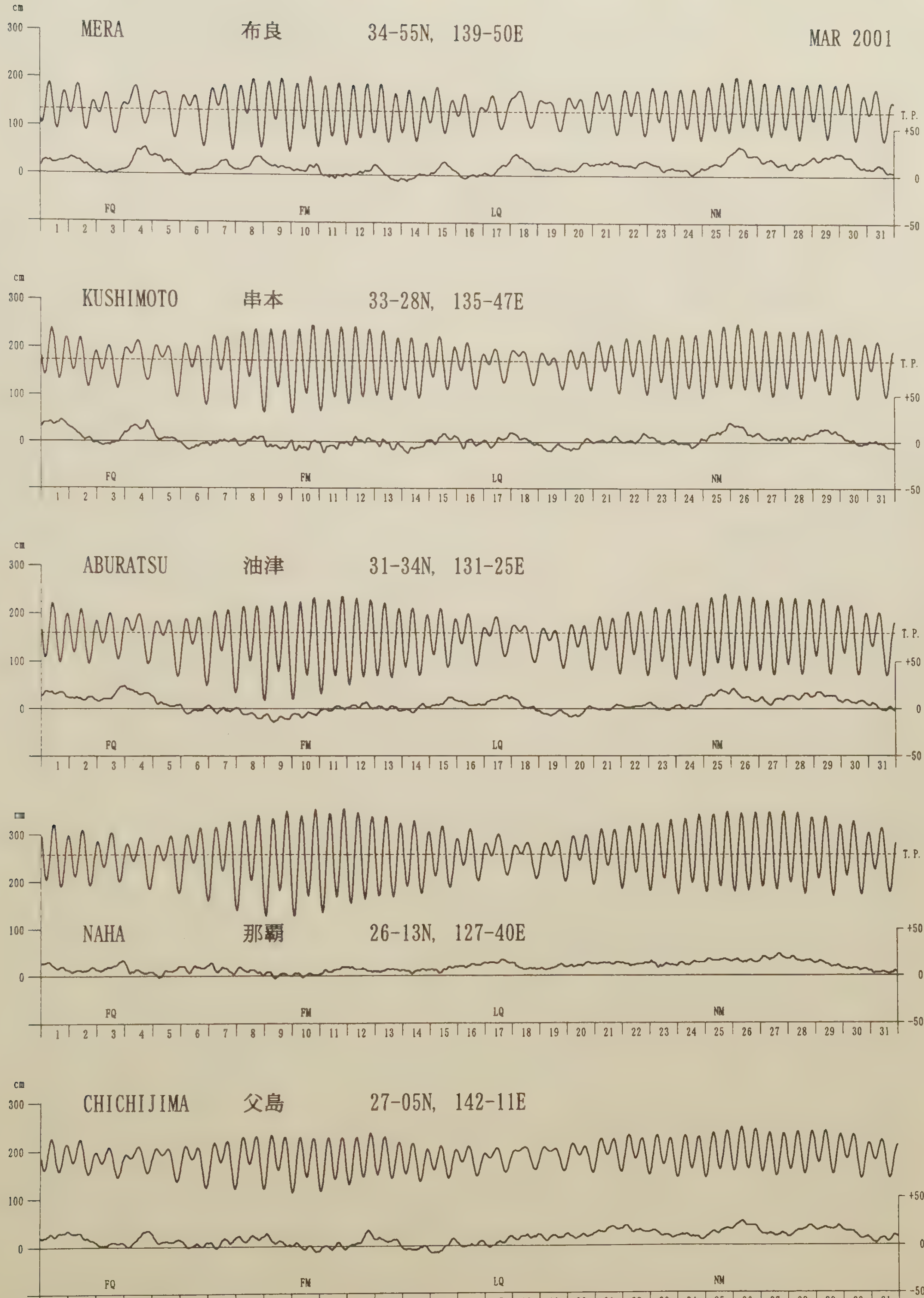


第15図 沿岸潮位時系列図（2001年 3月）

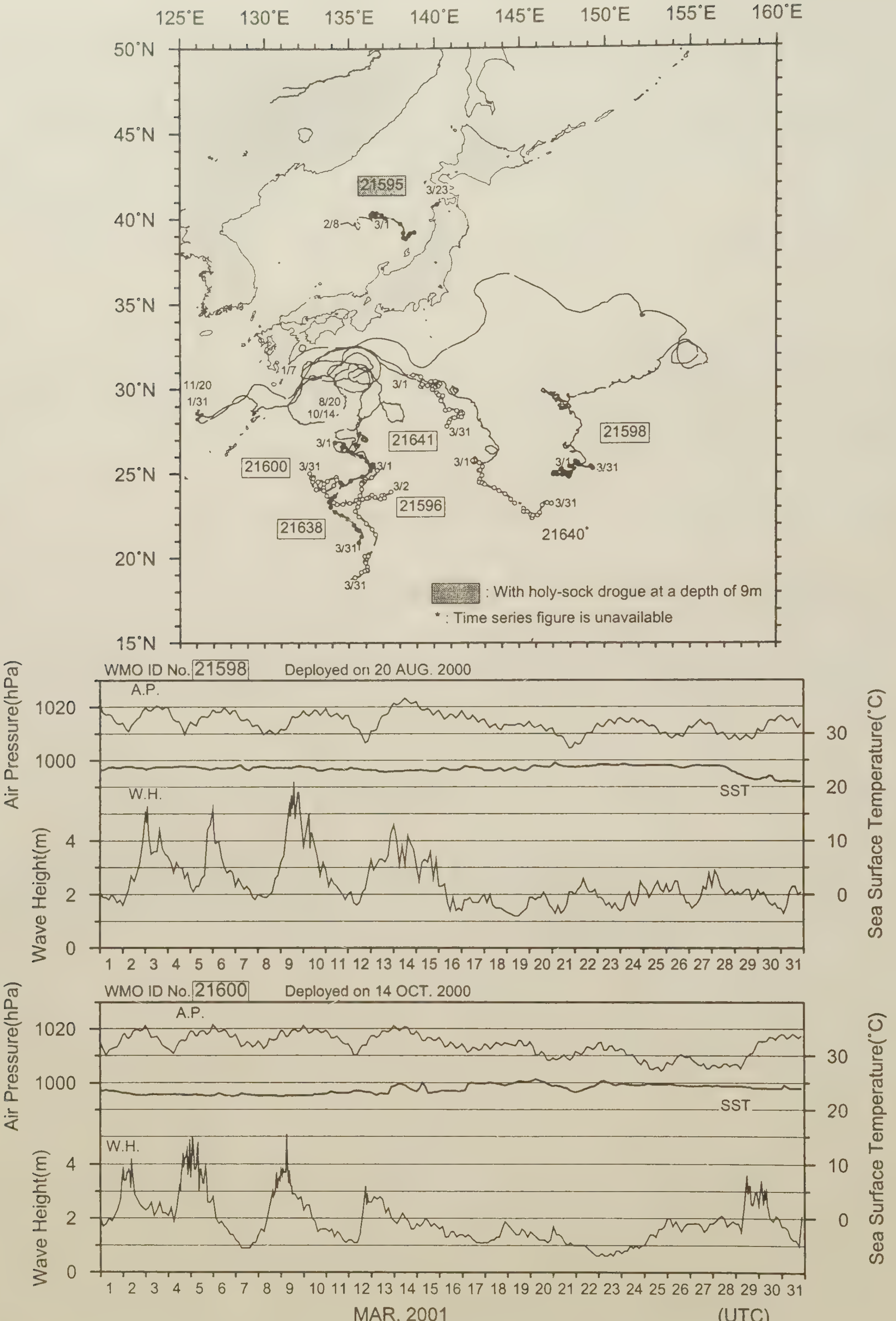
Fig. 14 Time series of hourly sea level observation (upper line) and its anomalies (lower line) at 9 stations of the JMA in the right panel.
Short term variations are removed from raw data.

NM: new moon, FQ: first quarter
FM: full moon, LQ: last quarter
T. P. : Mean sea level of Tokyo Bay (Tokyo Peil)



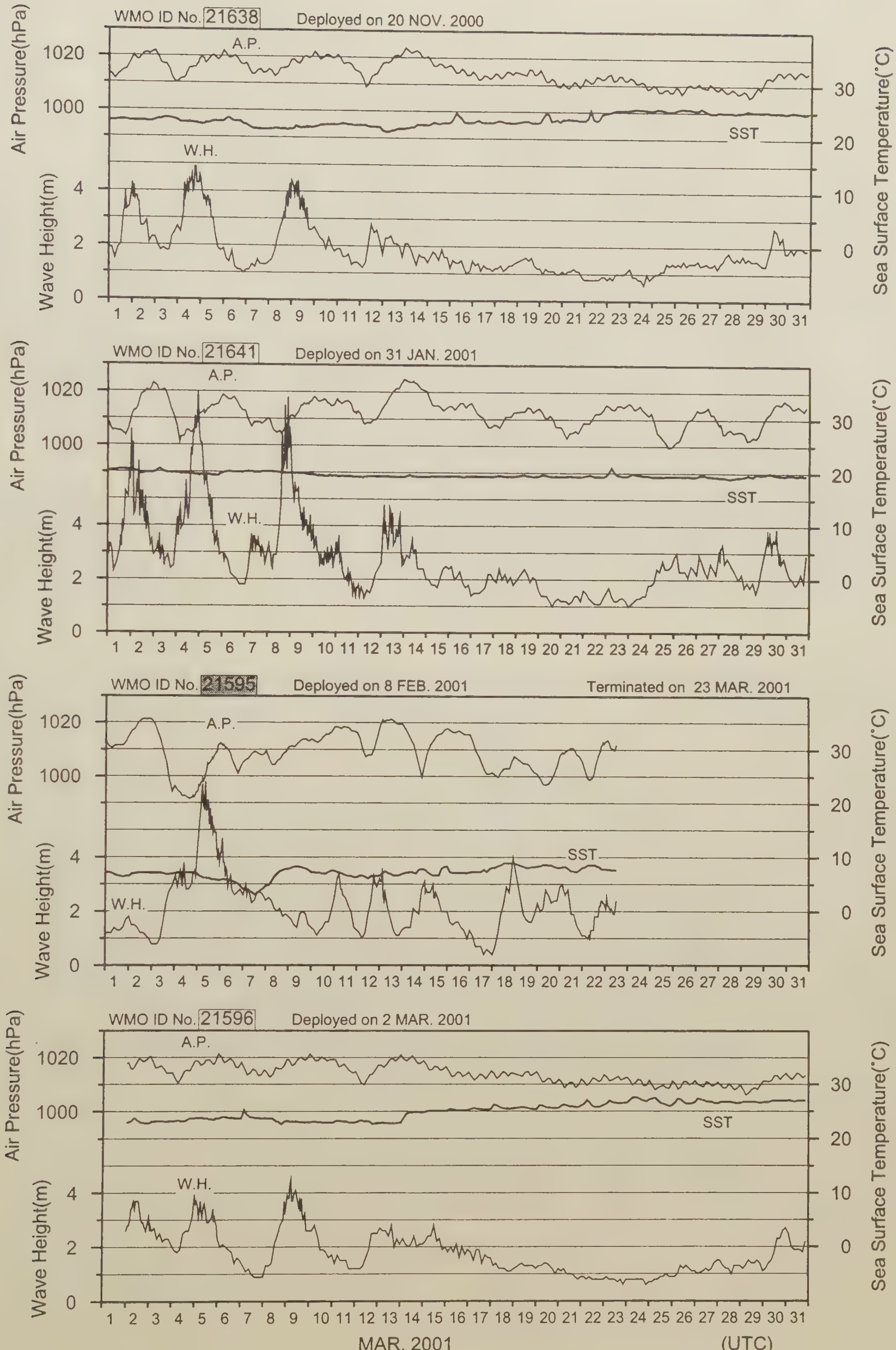


第15図 つづき
Fig. 15 continue

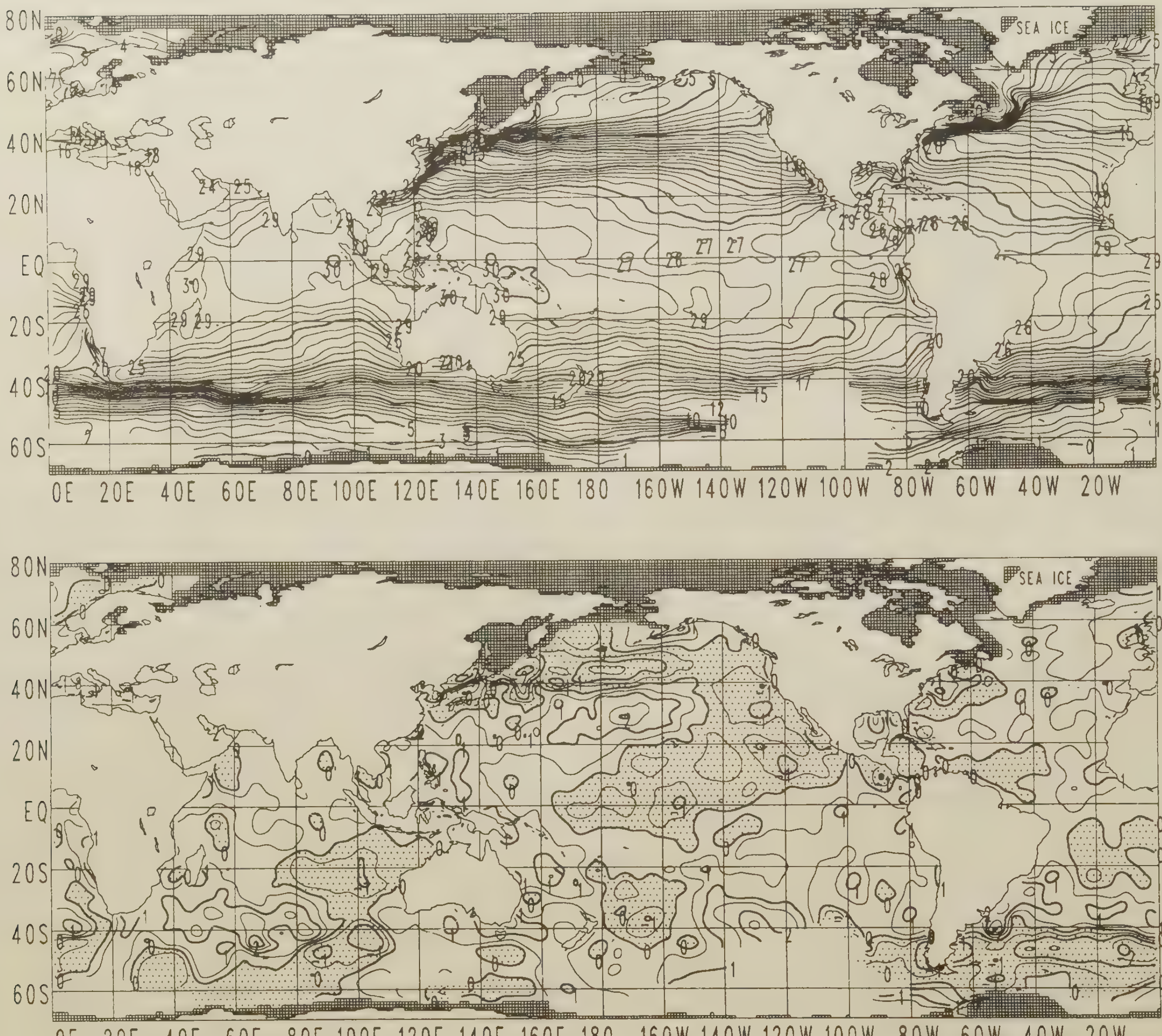


第16図　漂流型海洋気象ブイロボットの軌跡と観測要素の時系列図

Fig.16　Time series of JMA drifting buoy observation.
The upper panel shows paths of the buoys. Circles denote the position at 00h UTC everyday.
The lower panel shows time series of observation data.

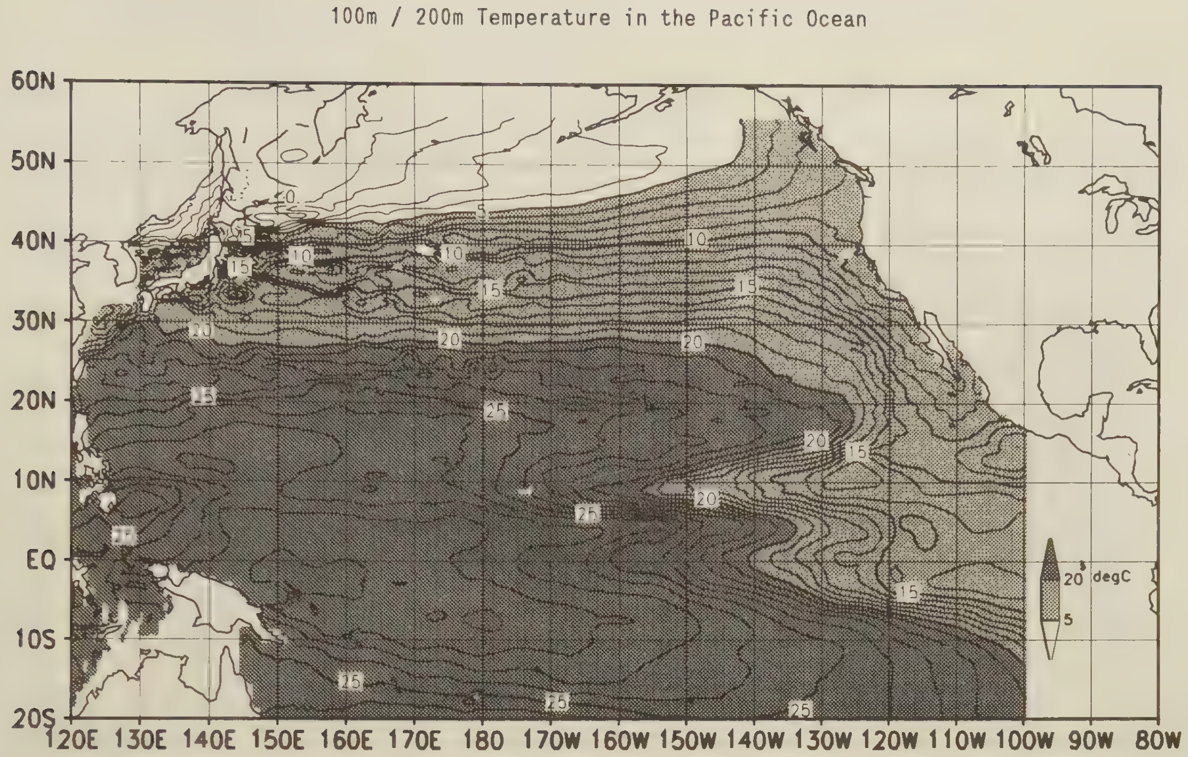


第16図 つづき
Fig.16 continue



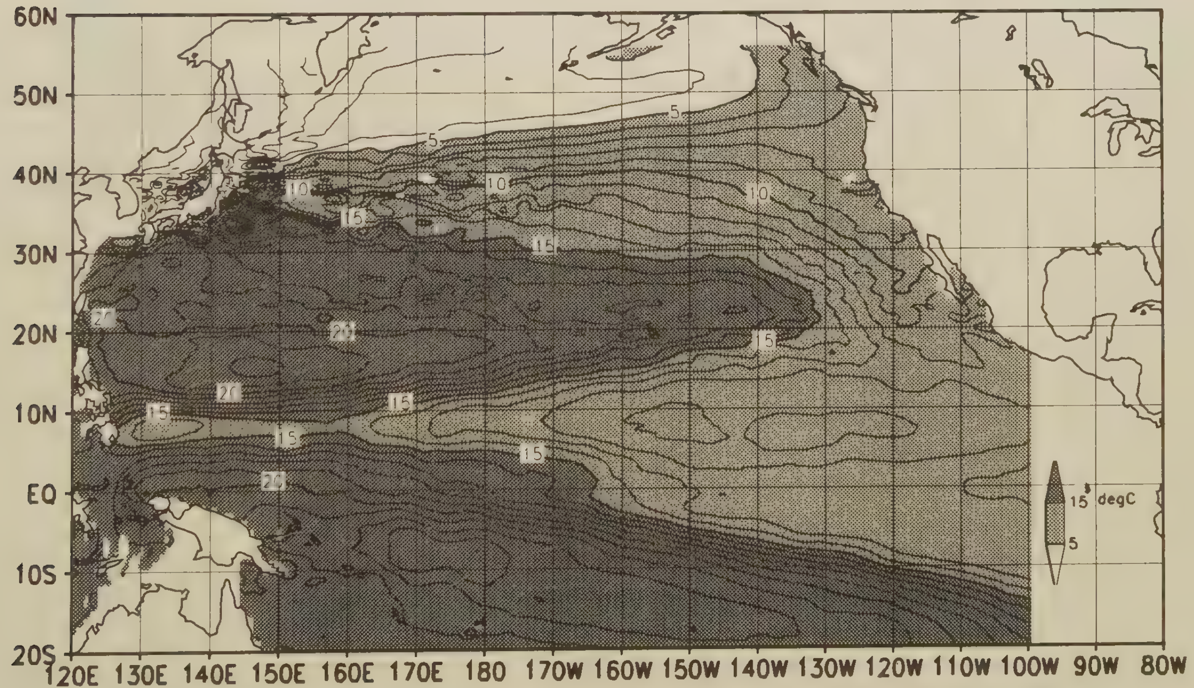
第17図　全球月平均海面水温図（上）及び偏差図（下）（2001年 3月）

Fig. 17 Monthly mean SST over the global ocean (top) and anomalies (bottom) for MAR 2001. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C (top) and additional anomaly contours of ±0.5°C are shown by thin lines. Negative anomalies are spotted. Maximum coverage of sea ice is shaded. Data sources for sea ice are U.S. National Ice Center (polar regions) and JMA (the Sea of Okhotsk).



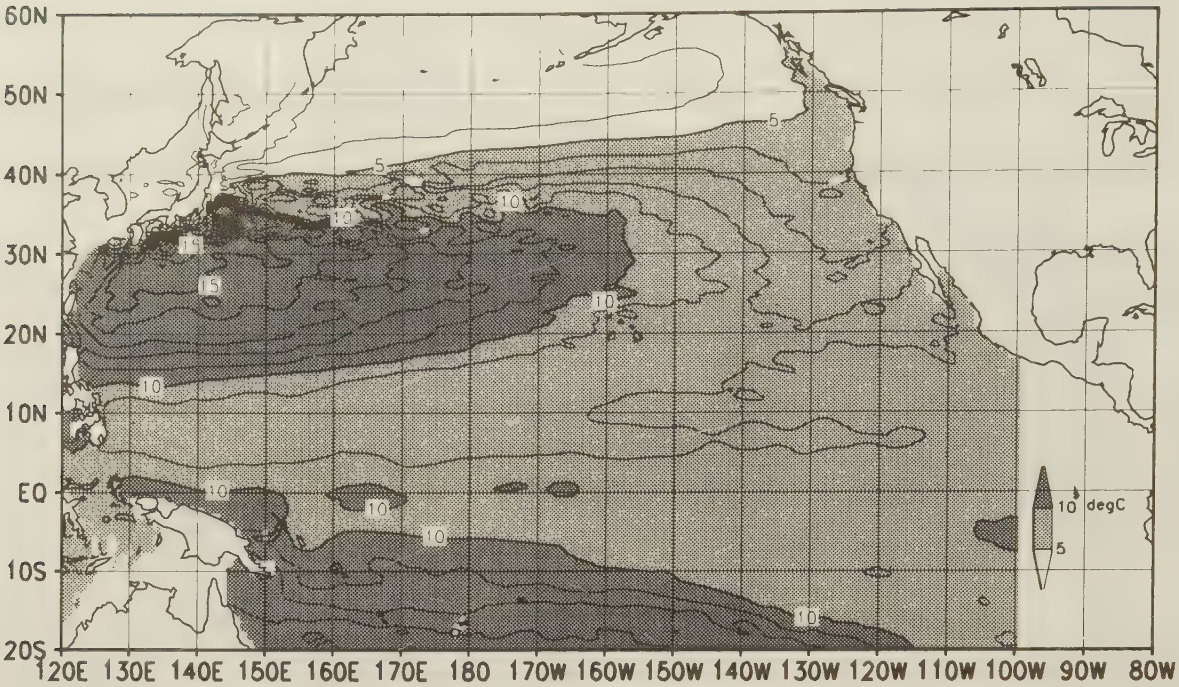
第 18 図　太平洋月平均表層水温図（深さ 100 m）　(2001 年 3 月)
（海洋総合解析システムによる）

Fig. 18　Monthly mean subsurface (100 m) temperature in the Pacific Ocean for March 2001. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



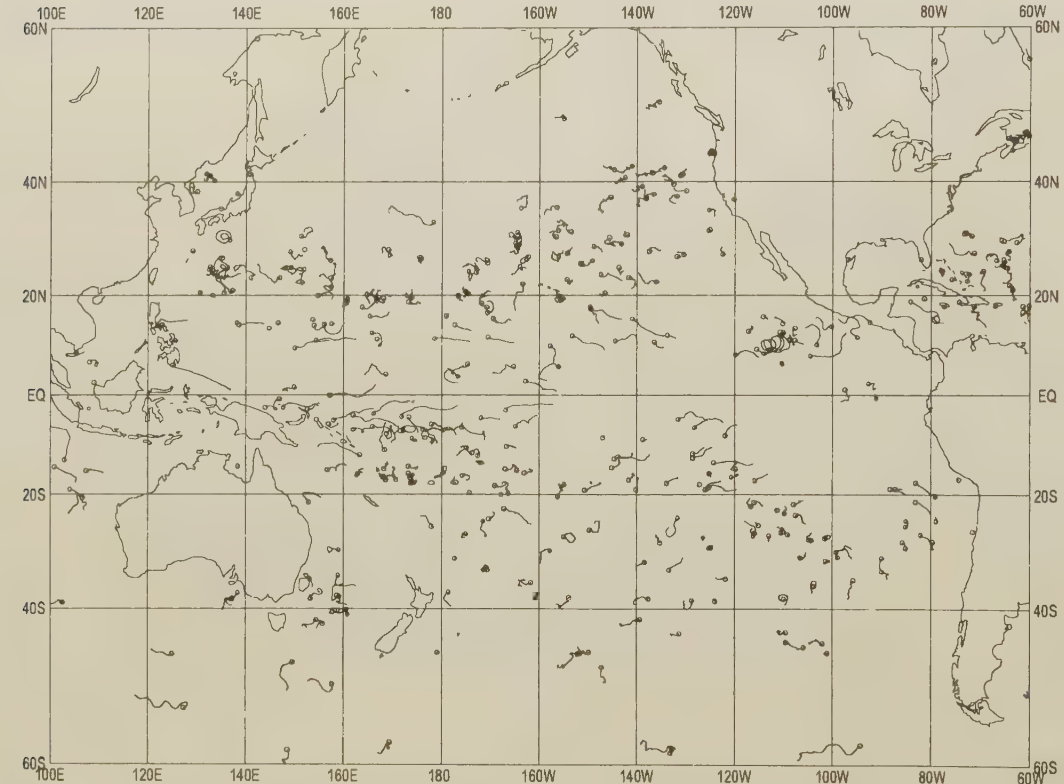
第 19 図　太平洋月平均表層水温図（深さ 200 m）　(2001 年 3 月)
（海洋総合解析システムによる）

Fig. 19　Monthly mean subsurface (200 m) temperature in the Pacific Ocean for March 2001. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



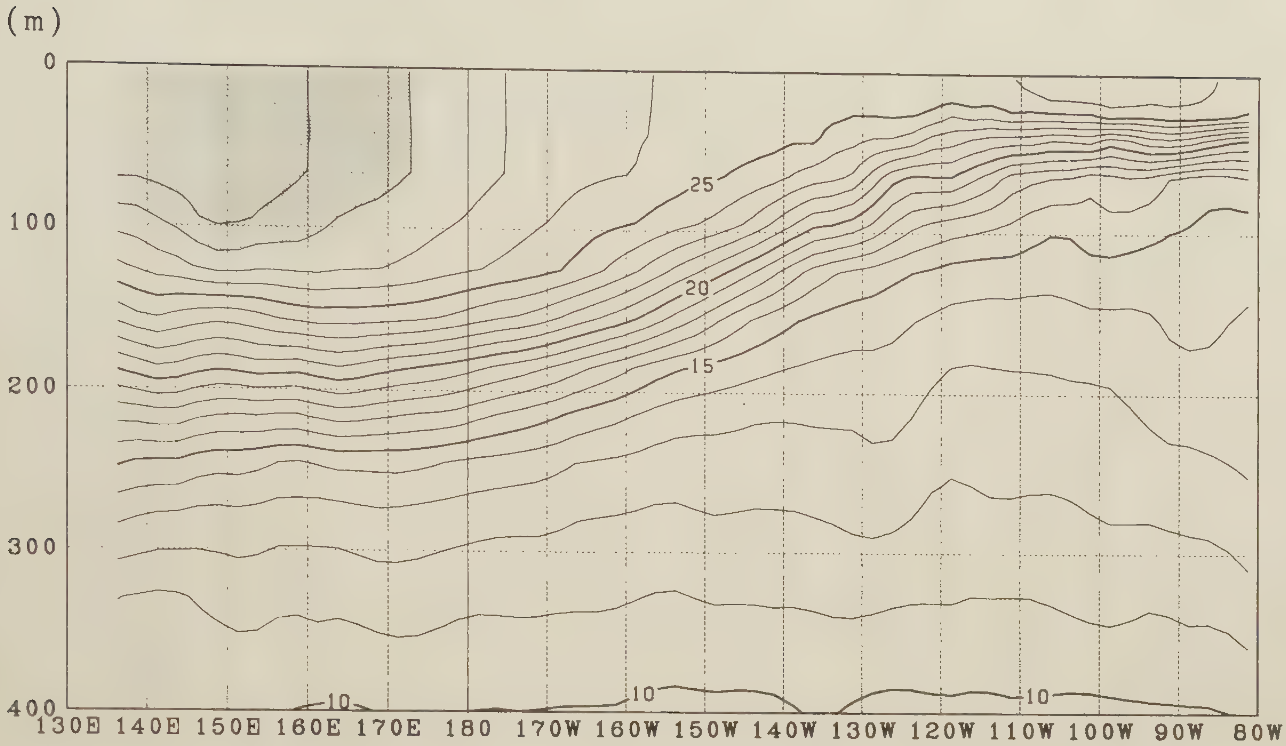
第 20 図　太平洋月平均表層水温図（深さ 400 m）（2001 年 3 月）
（海洋総合解析システムによる）

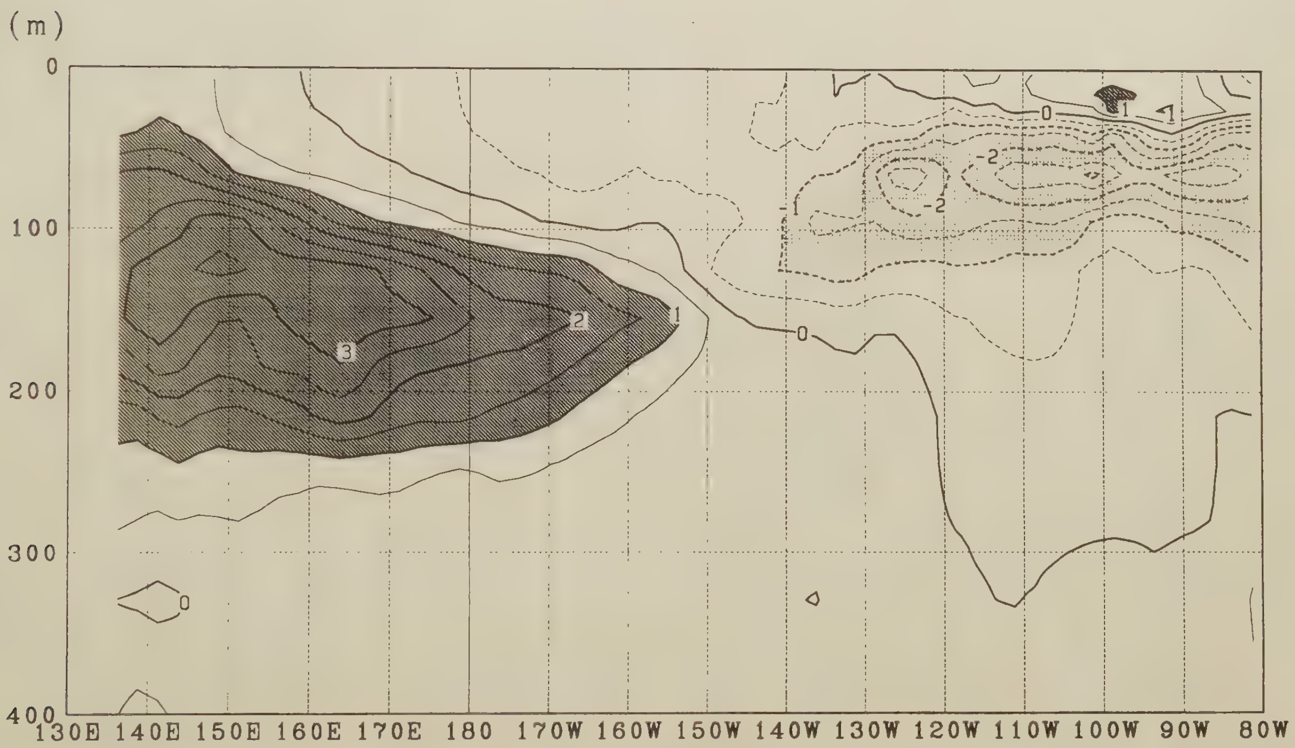
Fig. 20　Monthly mean subsurface (400 m) temperature in the Pacific Ocean for March 2001. Contour interval is 1 ˚C. (calculated by the Ocean Comprehensive Analysis System)



第 21 図　太平洋ブイ流跡図（2001 年 3 月）

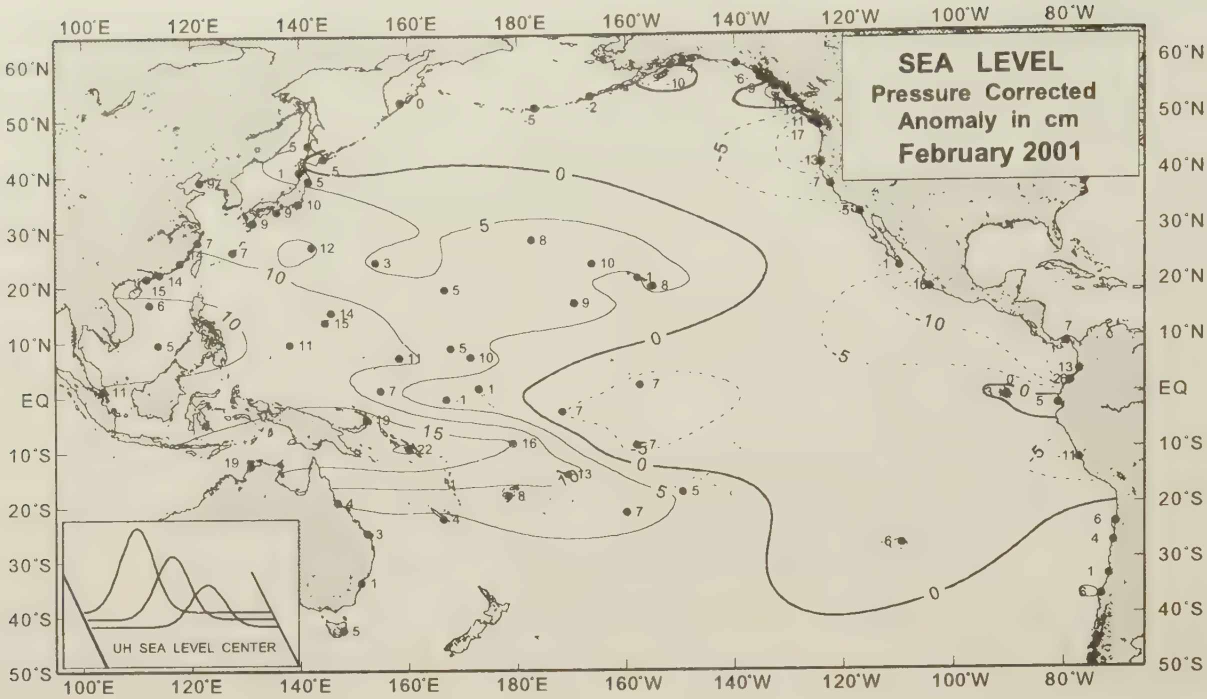
Fig. 21　Trajectories of drifting buoys in the Pacific Ocean during March 2001. Each track is for one buoy. Small circles represent the last positions for the month.





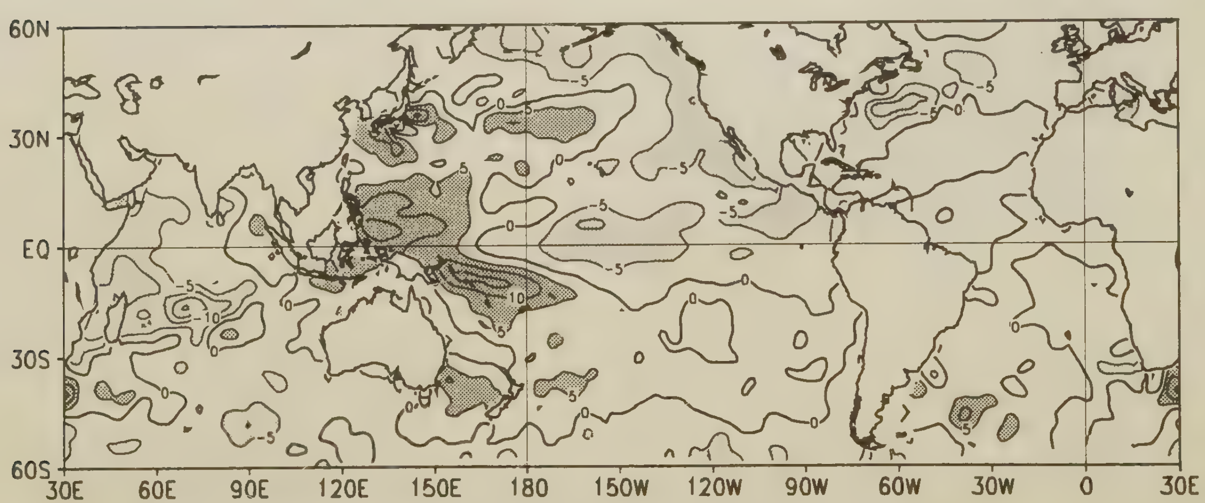
第22図　太平洋赤道に沿う表層水温（上）及び偏差（下）の深度－経度断面図（2001年 3月）

Fig. 22 Depth-longitude sections of temperature (top) and anomalies (bottom) along the equator in the Pacific Ocean for MAR 2001. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C (top) and 0.5°C (bottom). Values greater than 28°C in the top panel are shaded. In the bottom panel, values greater than 1°C are shaded and values less than -1°C are spotted. Anomalies are computed from 1987-1999 base period means.



第 23 図　太平洋月平均海面水位偏差図 （2001 年 2 月）

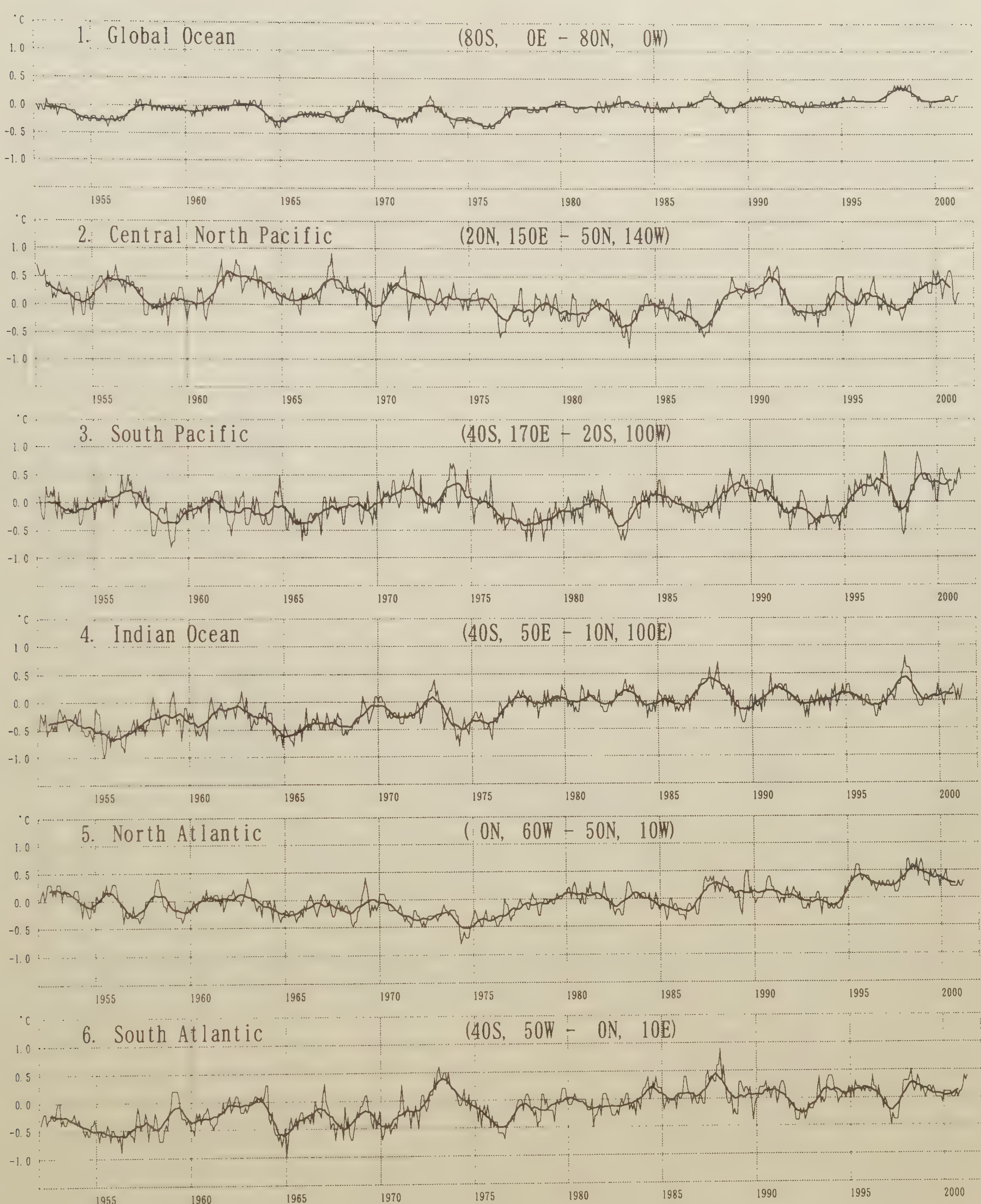
Fig. 23　Monthly sea level anomalies for February 2001 obtained from mean sea level (1975-1995) adjusted for atmospheric pressure. This figure is prepared by the SOC of ISLP-PAC, Department of Oceanography, University of Hawaii.



第 24 図　全球月平均海面高度偏差図 （2001 年 2 月）

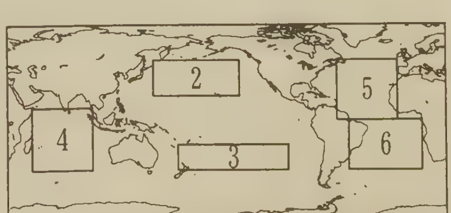
Fig. 24　Monthly sea surface height anomalies in the global ocean derived from the altimeter data of TOPEX/POSEIDON for February 2001. Contour interval is 5 cm. Positive anomalies exceeding +5 cm are shaded and negative anomalies exceeding -5 cm are spotted. Anomalies are computed from 1993-1998 base period means.

Long-term Variation of Monthly Mean SST Anomalies

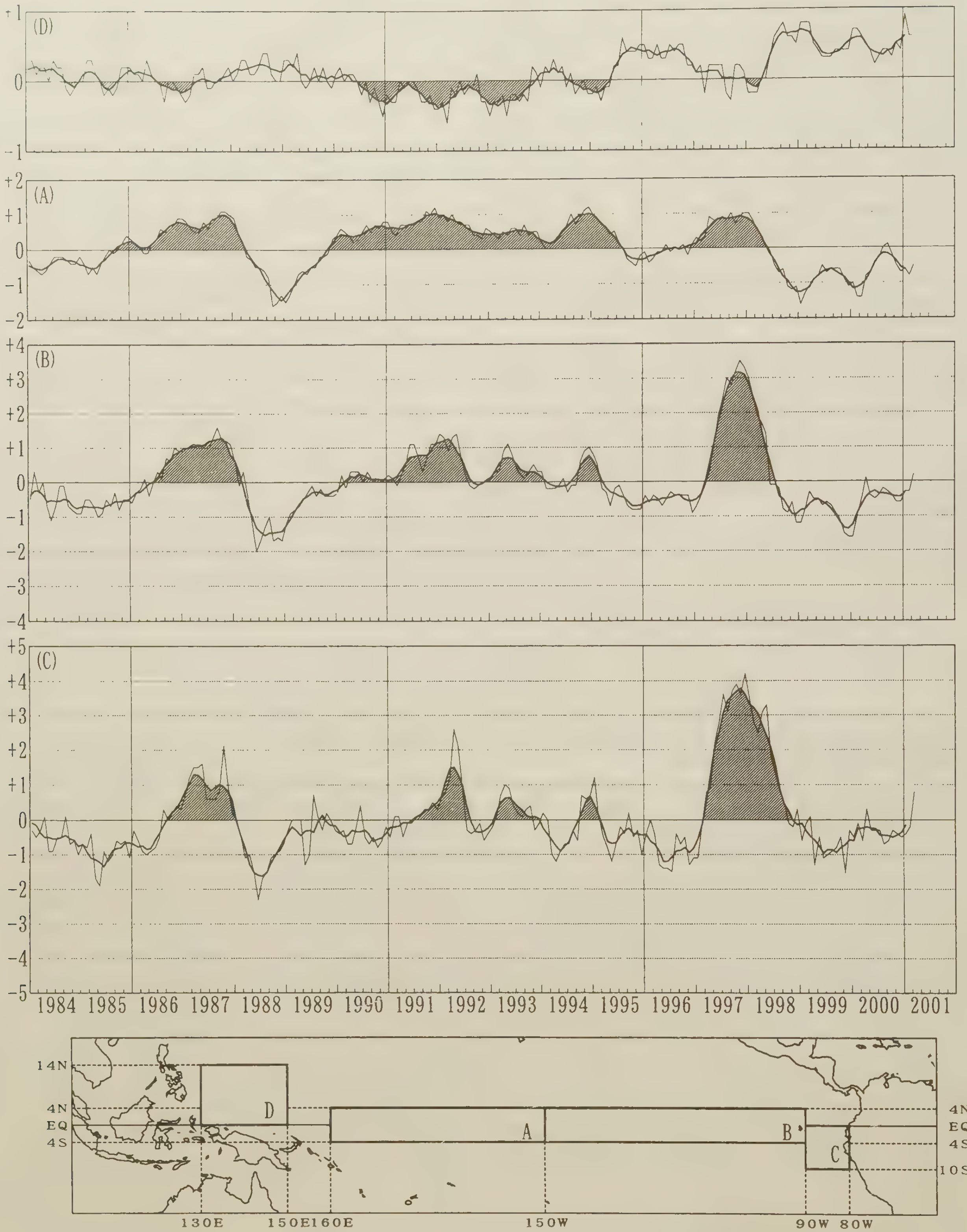


第24図 海域平均海面水温偏差の長期変動

Fig. 24 Long-term variations of monthly mean sea surface temperature anomalies (°C) for the areas shown in the right panel. Anomalies are computed from the JMA climatology (1971-2000). Thin lines show the monthly mean and thick lines their 13-month running means.



Time Series of Tropical Pacific SST Anomalies



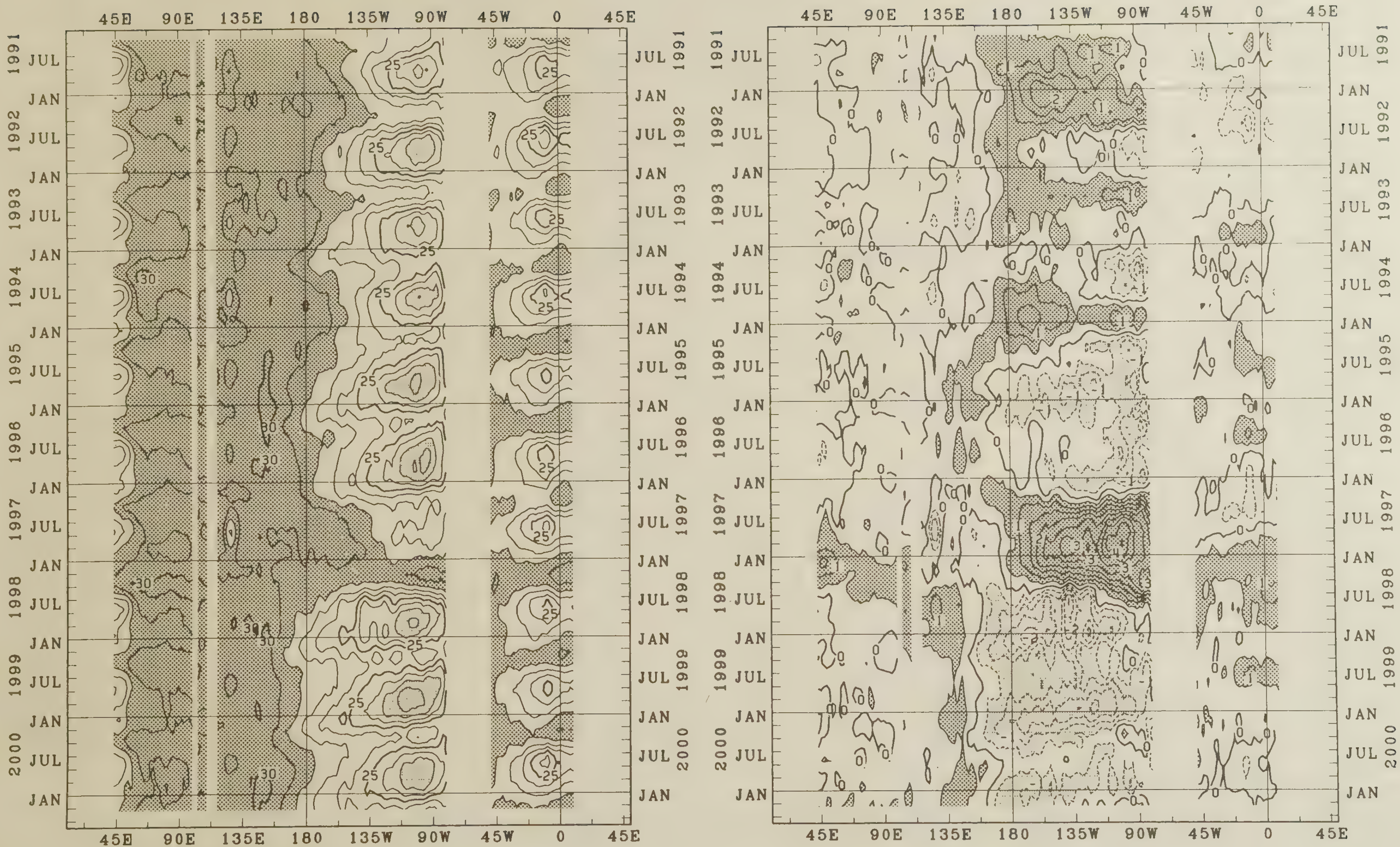
第26図　太平洋熱帯域の海面水温偏差時系列図

Fig. 26 Time series of monthly mean SST anomalies (°C) in the tropical Pacific Ocean for the areas indicated at the bottom panel. Thin lines show the monthly means and thick lines their 5-month running means. Positive anomalies (A, B, C) and negative anomalies (D) are shaded. Anomalies are computed from the JMA climatology (1971-2000).

MONTH YEAR	SEA SURFACE TEMPERATURE AND ANOMALY (°C) REGION D 14N-EQ 130E-150E		REGION A 4N-4S 160E-150W		REGION B 4N-4S 150W-90W		REGION C EQ-10S 90W-80W		SOI	SEA LEVEL PRESSURE ANOMALY (hPa) TAHITI 17-33S 149-37W	DARWIN 12-24S 130-52E
JAN 99	29.3	0.8	26.4	-1.6	24.2	-1.2	23.9	-0.6	1.5	2.2	-1.2
FEB 99	29.1	0.8	26.7	-1.3	25.5	-0.8	25.9	-0.1	0.8	1.8	-0.2
MAR 99	29.3	0.8	27.0	-1.1	26.8	-0.3	26.4	0.1	0.9	0.9	-1.2
APR 99	29.3	0.5	27.3	-0.9	26.7	-0.5	24.1	-1.3	1.6	2.0	-0.5
MAY 99	29.7	0.4	27.8	-0.8	26.4	-0.5	23.8	-0.5	0.2	1.5	1.2
JUN 99	29.7	0.3	28.0	-0.5	25.5	-0.7	21.8	-1.1	0.3	1.2	0.7
JUL 99	29.6	0.3	27.8	-0.7	24.8	-0.6	20.9	-1.0	0.4	1.3	0.6
AUG 99	29.5	0.3	27.8	-0.6	24.0	-0.7	20.0	-0.9	0.4	1.8	1.2
SEP 99	29.7	0.4	27.8	-0.6	23.8	-0.9	19.7	-0.8	0.0	0.6	0.6
OCT 99	29.8	0.4	27.8	-0.6	23.6	-1.1	20.4	-0.5	1.1	1.7	-0.0
NOV 99	29.7	0.4	27.5	-0.9	23.2	-1.5	20.3	-1.5	1.2	1.6	-0.4
DEC 99	29.4	0.4	27.1	-1.1	23.4	-1.6	22.6	-0.3	1.6	2.6	-0.3
JAN 00	29.2	0.7	27.0	-1.0	23.8	-1.6	24.0	-0.5	0.5	1.7	0.6
FEB 00	29.0	0.7	26.6	-1.4	25.3	-1.0	25.9	-0.1	1.2	3.1	0.2
MAR 00	29.1	0.6	26.7	-1.4	26.6	-0.5	25.7	-0.6	1.1	2.1	-0.2
APR 00	29.3	0.5	27.4	-0.8	27.3	0.1	25.7	0.3	1.4	1.5	-0.6
MAY 00	29.7	0.4	27.9	-0.7	26.5	-0.4	24.0	-0.3	0.3	1.2	0.8
JUN 00	29.6	0.2	28.1	-0.4	25.7	-0.5	22.6	-0.3	-0.4	0.8	1.2
JUL 00	29.6	0.3	28.2	-0.3	25.0	-0.4	21.6	-0.3	-0.3	-0.1	0.5
AUG 00	29.6	0.4	28.4	0.0	24.5	-0.2	20.2	-0.7	0.7	0.7	-0.5
SEP 00	29.7	0.4	28.5	0.1	24.4	-0.3	19.9	-0.6	1.0	2.0	0.2
OCT 00	29.7	0.3	28.2	-0.2	24.3	-0.4	20.6	-0.3	1.0	0.7	-1.0
NOV 00	29.8	0.5	27.9	-0.5	24.1	-0.6	21.4	-0.4	1.9	1.6	-1.9
DEC 00	29.4	0.4	27.5	-0.7	24.4	-0.6	22.4	-0.5	0.9	-0.3	-2.1
JAN 01	29.4	0.9	27.4	-0.6	25.1	-0.3	24.1	-0.4	0.8	3.0	1.1
FEB 01	28.9	0.6	27.2	-0.8	26.0	-0.3	25.8	-0.2	1.0	-0.0	-2.7
MAR 01	29.1	0.6	27.6	-0.5	27.3	0.2	27.1	0.8	0.8	1.8	0.2

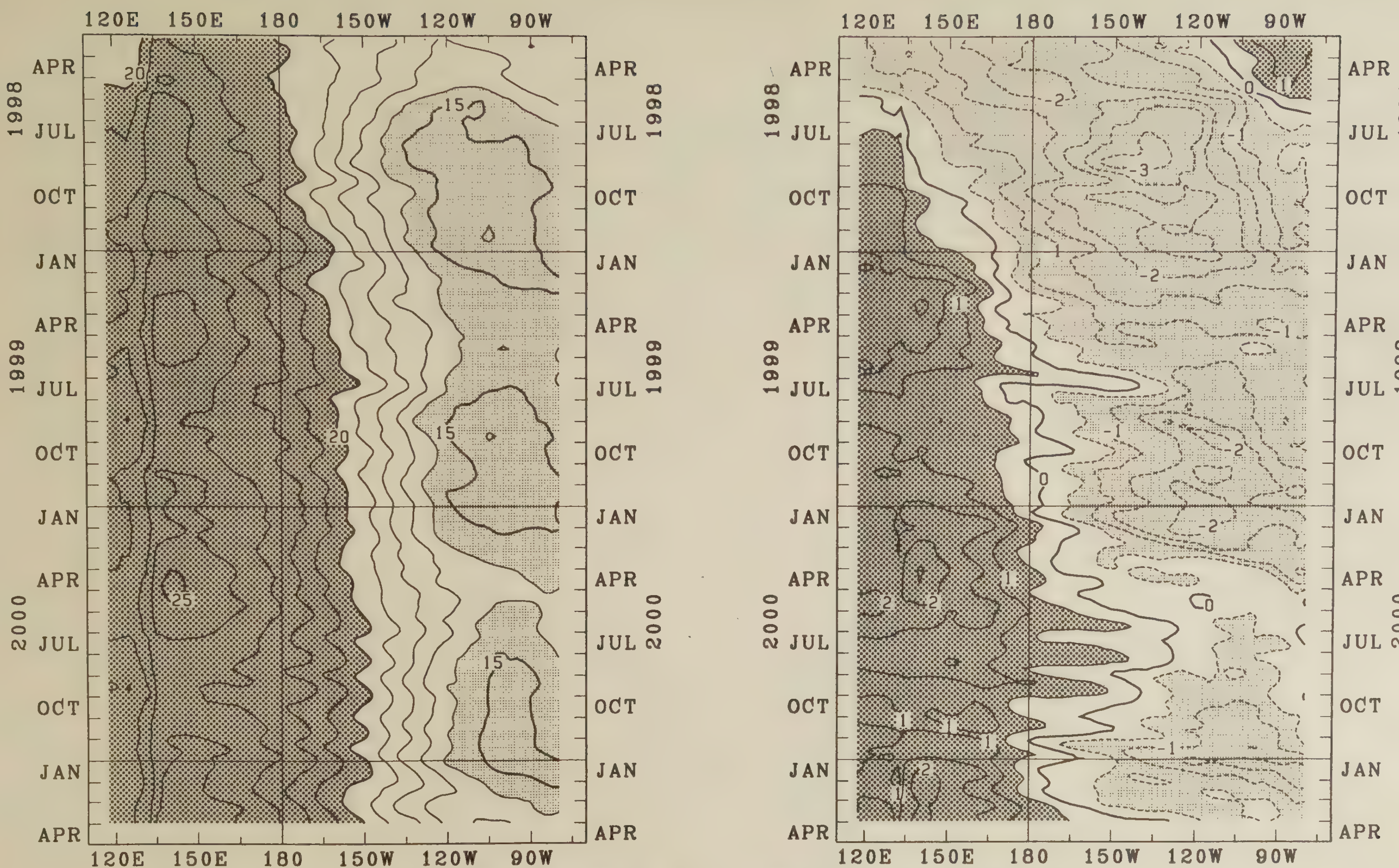
第1表　太平洋熱帯域の大気及び海洋の監視指数

Table 1 Atmospheric and oceanic monitoring indices in the tropical Pacific Ocean



第27図　赤道に沿った海面水温（左）および偏差（右）の時間-経度断面図

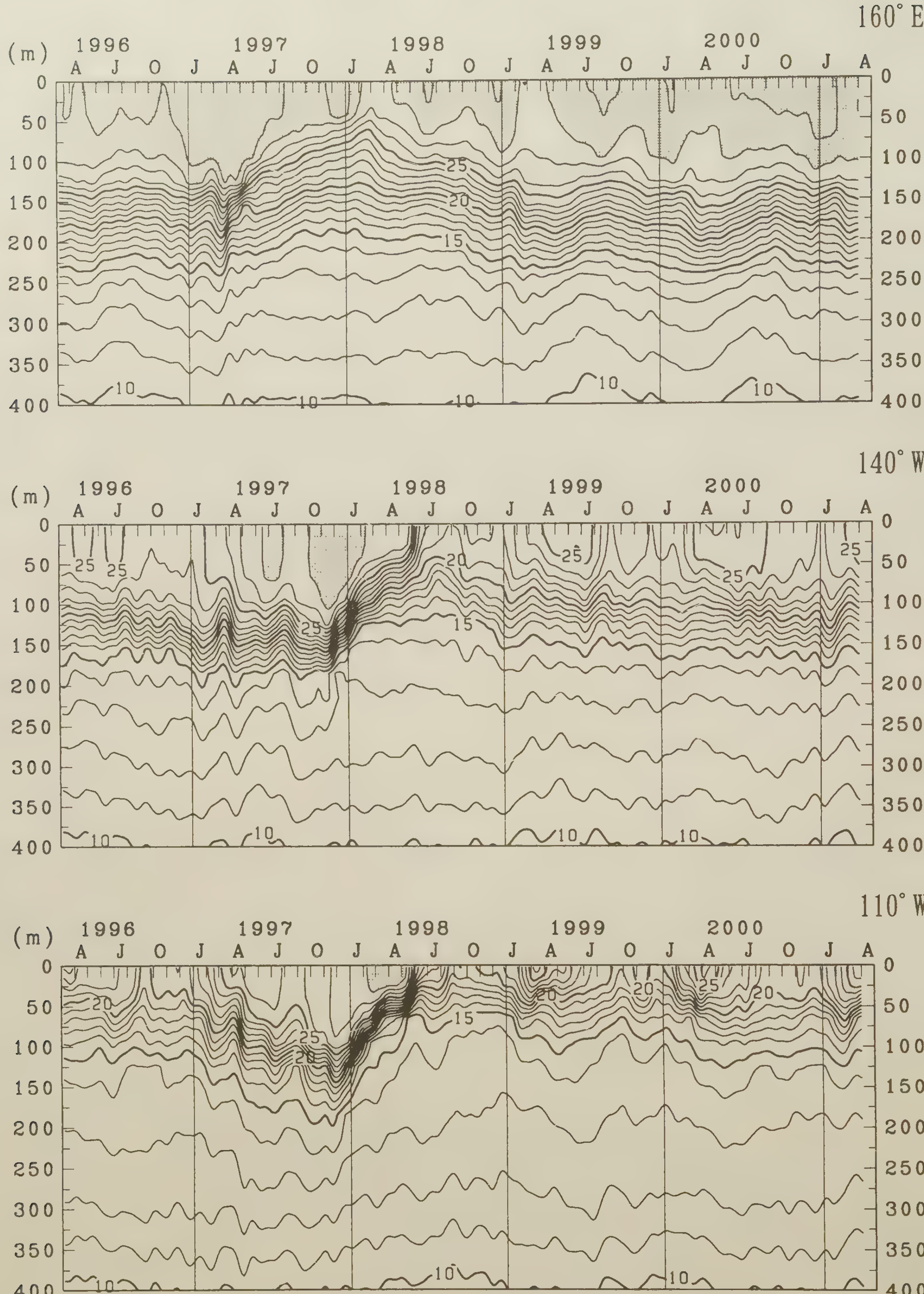
Fig. 27　Time-longitude sections of SSTs (left) and anomalies (right) along the equator (2 °N-2 °S) in the global ocean. Contour interval is 1 °C (left) and 0.5 °C (right). Values greater than 28 °C are shaded and values less than 23 °C are spotted in the left panel. Dashed contours indicate negative anomalies in the right panel. Anomalies are computed from 1971-2000 base period means.



第28図　太平洋の赤道に沿う海洋表層の貯熱量（左）及び偏差（右）の時間－経度断面図

Fig. 28 Time-longitude sections of ocean heat content in the upper 260 m along the equator (left) and anomalies (right) in the Pacific Ocean. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C (left) and 0.5°C (right). Values greater than 20°C are shaded and values less than 16°C are spotted in the left panel. Dashed contours indicate negative anomalies in the right panel. Anomalies are computed from 1987-1999 base period means.

Time-depth Sections of Equatorial Subsurface Temperature



第29図　太平洋赤道域の表層水温の時間－深度断面図

（上：西部、中：中部、下：東部）

Fig. 29　Time-depth sections of equatorial subsurface temperature for the western Pacific (top, 160°E), the central Pacific (middle, 140°W) and the eastern Pacific (bottom, 110°W).　Data are derived from the Ocean Data Assimilation System of JMA.　Contour interval is 1°C. Values greater than 28°C are shaded.

Sea Ice

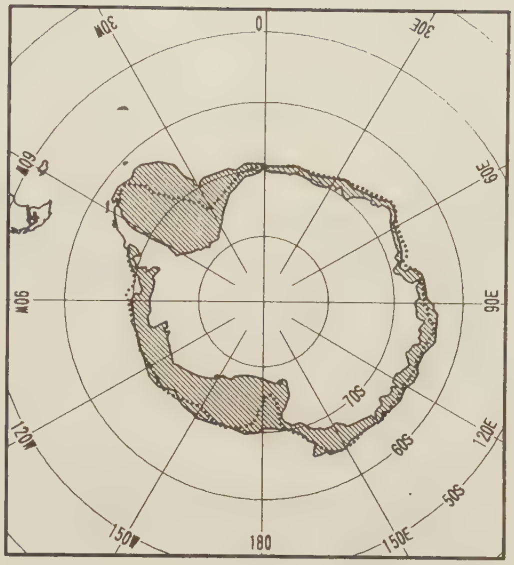


第30-1図　北極域の海氷図（2001年 3月16日）

Fig.30-1 Sea ice chart in the Arctic on 16 Mar. 2001.

The shaded area represents the sea ice extent. The dotted line denotes the mean ice edge averaged for the period from 1972 through 1990.

The data source is the National Ice Center (USA).

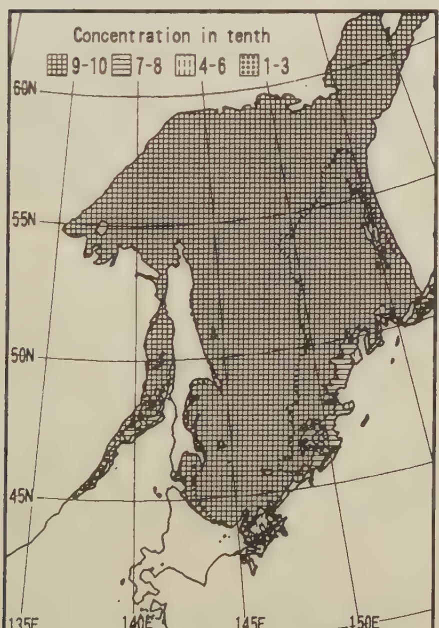


第30-2図　南極域の海氷図（2001年 3月16日）

Fig.30-2 Sea ice chart in the Antarctic on 16 Mar. 2001.

The shaded area represents the sea ice extent. The dotted line denotes the mean ice edge averaged for the period from 1973 through 1990.

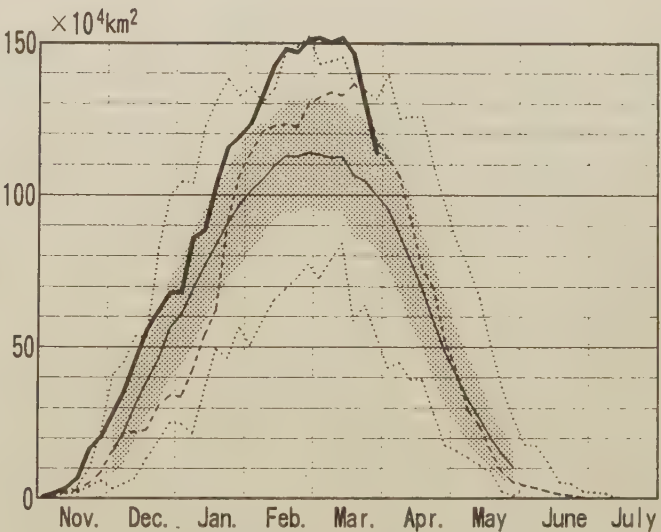
The data source is the National Ice Center (USA).



第30-3図 オホーツク海の海氷図（2001年 3月15日）

Fig.30-3 Sea ice chart in the Sea of Okhotsk on 15 Mar. 2001.

The dotted line denotes the mean ice edge averaged for the period from 1971 through 2000.



第30-4図 オホーツク海の海氷域面積

Fig.30-4 Time-series of 5-day sea ice extent in the Sea of Okhotsk.

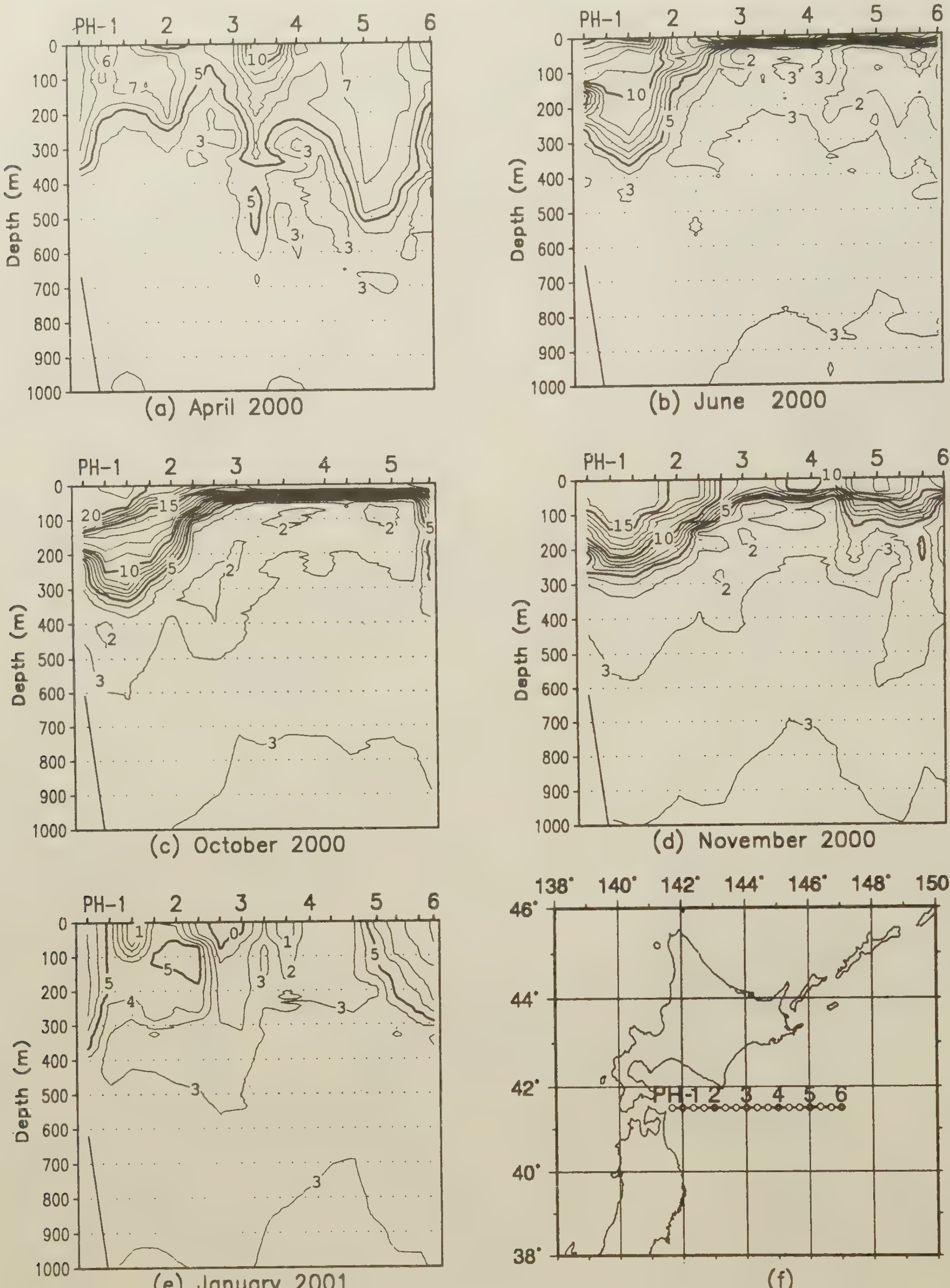
: current season (2000/2001)

: mean extent (1971-2000)

: maximum or minimum extent (1971-2000)

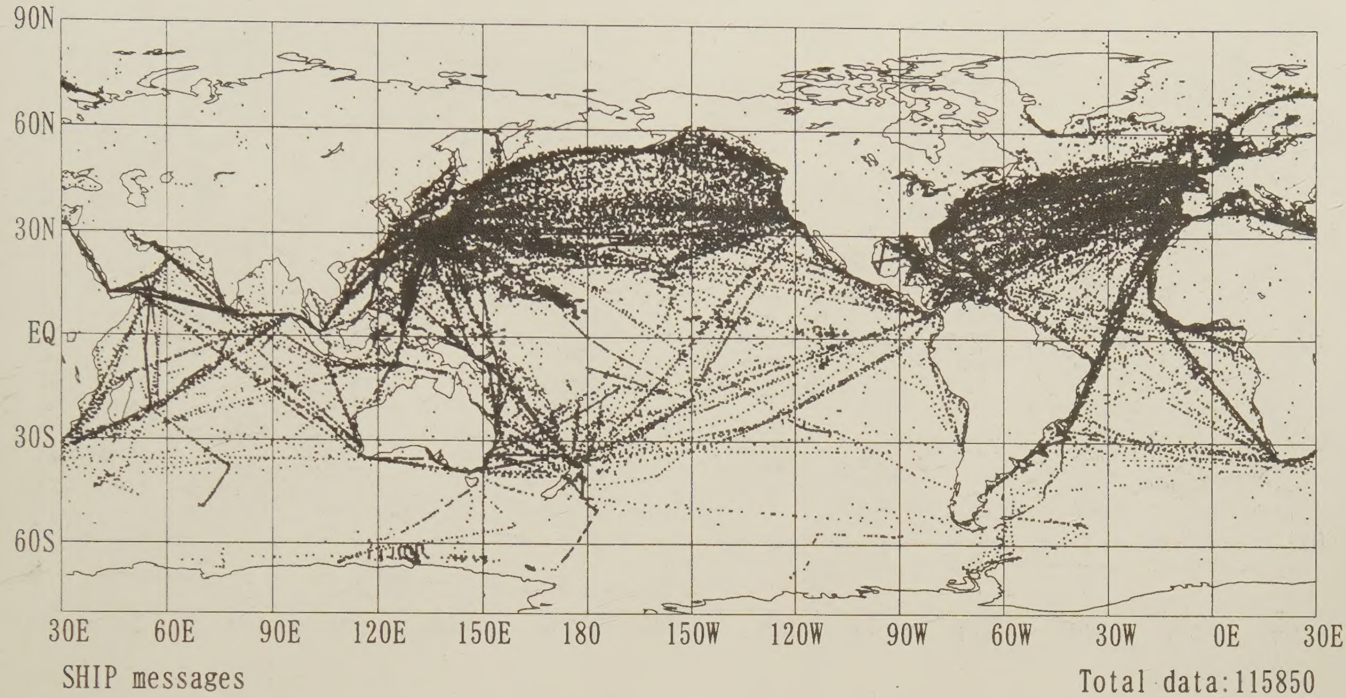
: last season (1999/2000)

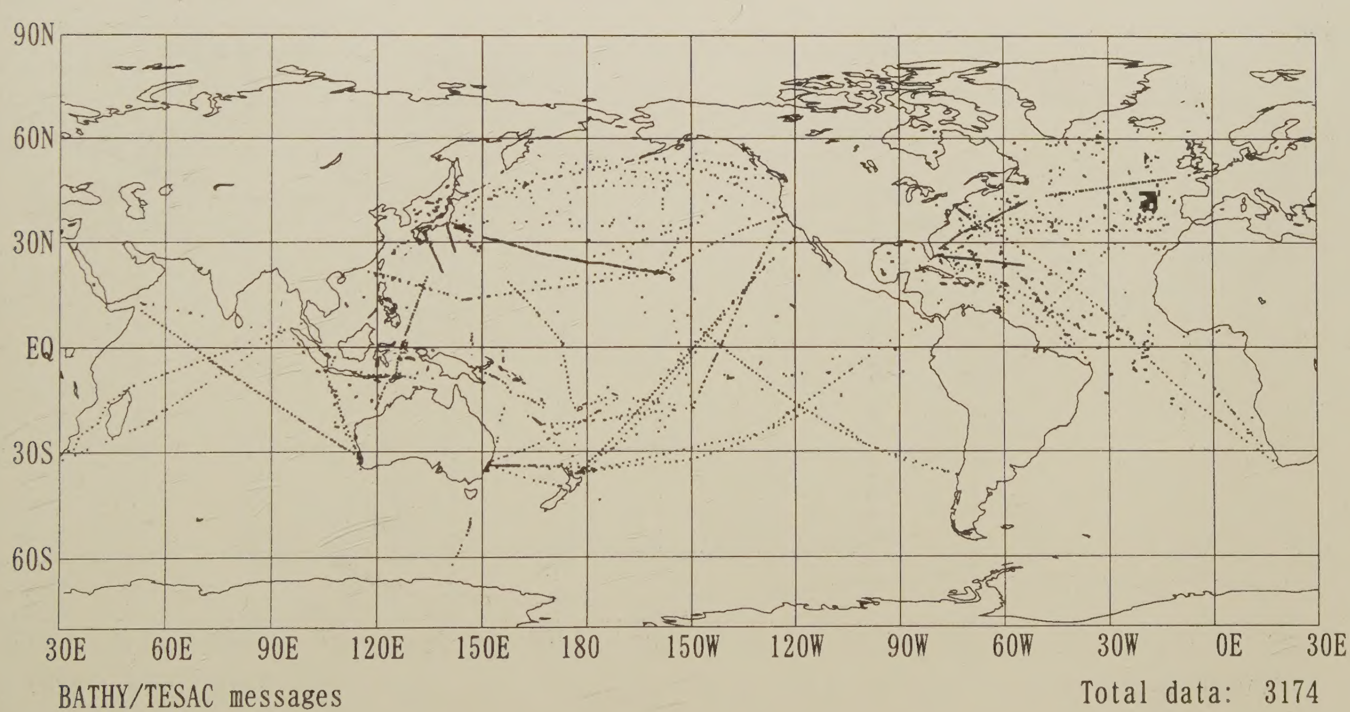
: mean $\pm 1\sigma$ (1971-2000)



第 31 図　函館海洋気象台高風丸によるPH線に沿った水温鉛直断面図. (a) 2000年4月、(b) 2000年6月、(c) 2000年10月、(d) 2000年11月、(e) 2001年1月、(f) PH線の位置図

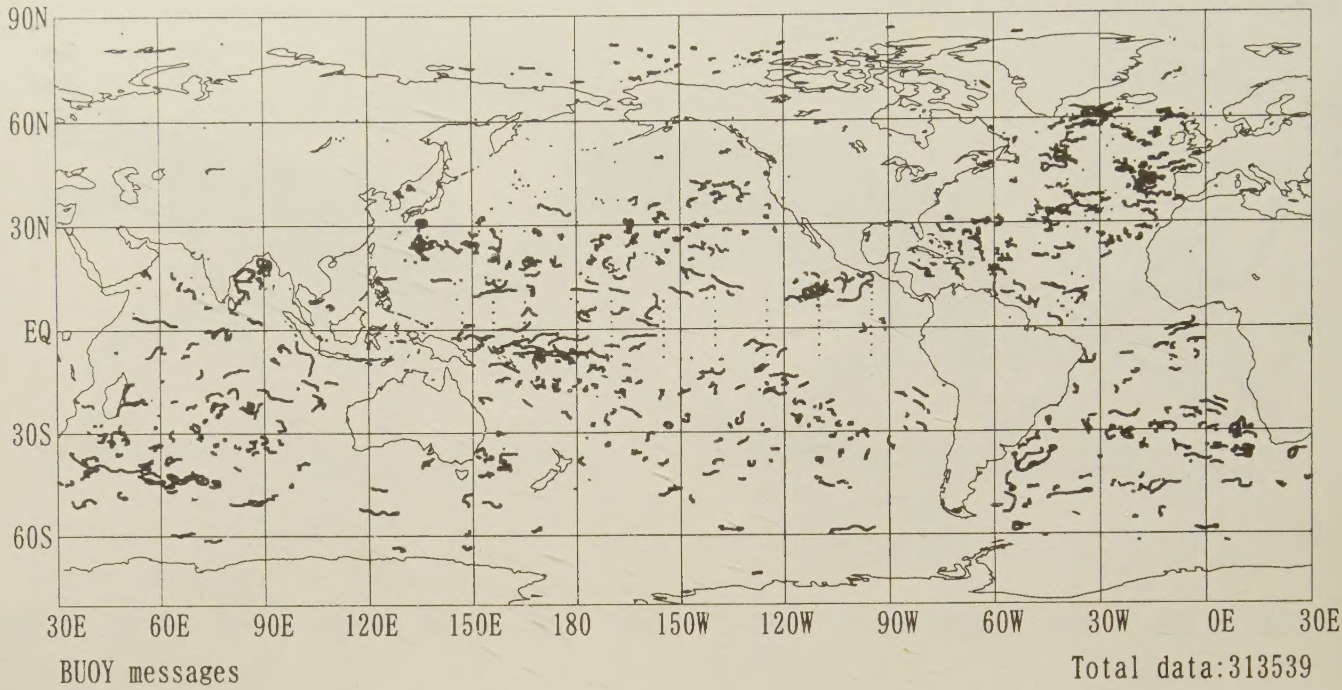
Fig.31 Vertical sections of temperature(℃)along the PH line observed by R/V Kofu maru of Hakodate Marine Observatory of the Japan Meteorological Agency. (a) April 2000, (b) June 2000, (c) October 2000, (d) November 2000, (e) January 2001, (f) Location of the PH line.

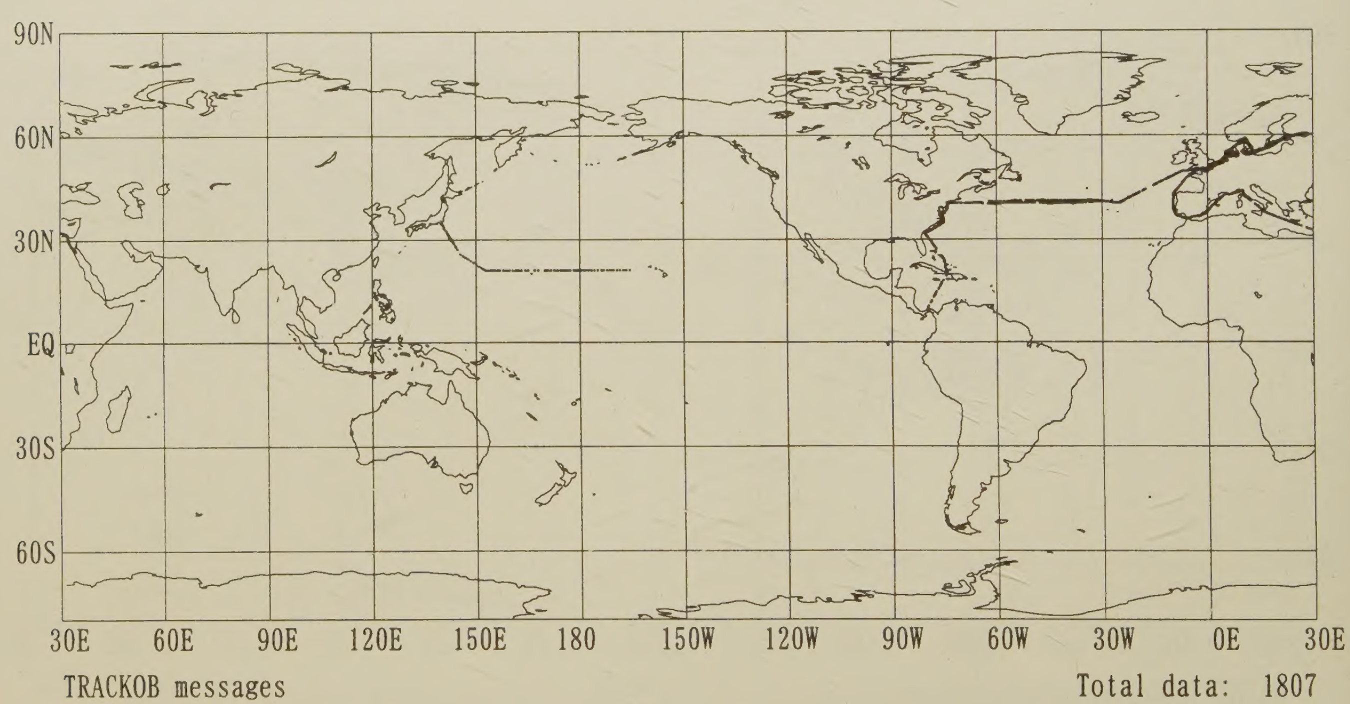




第32-1図　測点分布図(2001年 3月)

Fig. 32-1 Geographical distribution of SHIP messages (SST data, top) and BATHY/TESAC messages (subsurface temperature data, bottom) for MAR 2001.





第32-2図 測点分布図(2001年 3月)

Fig. 32-2 Geographical distribution of BUOY messages (buoy drift and SST data, top) and TRACKOB messages (ship drift and SST data, bottom) for MAR 2001.

気象庁海洋月報

Monthly Ocean Report

March 2001 (No. 99)

本月報掲載の2001年3月のプロダクトには、気象庁が観測したデータ及びGTS（全球気象通信網）を通じて入手した国際気象通報式による通報のほか、下記の機関等から提供いただいたデータを使用しています。御礼申し上げます。

防衛庁、水産庁、海上保安庁

海洋科学技術センター、（社）漁業情報サービスセンター

北海道大学、東北大学、鹿児島大学

水産試験場等（青森県、岩手県、宮城県、秋田県、山形県、福島県、茨城県、東京都、新潟県、富山県、石川県、福井県、静岡県、愛知県、三重県、京都府、兵庫県、和歌山県、島根県、山口県、徳島県、佐賀県、宮崎県、沖縄県）

（順不同）

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